ARCHAEOLOGICAL AND ARCHITECTURAL SURVEY OF THE CENTRAL ELECTRIC POWER COOPERATIVE SPRING BRANCH 115kV LINE, BAMBERG COUNTY, SOUTH CAROLINA

CHICORA RESEARCH CONTRIBUTION 287

© 2001 by Chicora Foundation, Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, transmitted, or transcribed in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior permission of Chicora Foundation, Inc. except for brief quotations used in reviews. Full credit must be given to the authors, publisher, and project sponsor.

ARCHAEOLOGICAL AND ARCHITECTURAL SURVEY OF THE CENTRAL ELECTRIC POWER COOPERATIVE SPRING BRANCH 115kV LINE, BAMBERG COUNTY, SOUTH CAROLINA

Prepared By:
Michael Trinkley, Ph.D., RPA
and
Rachel Campo, M.A.

With Contributions By:
Keith C. Seramur, P.G.
Geonetics Corporation
Boone, North Carolina 28607

Prepared For:
Mr. Robert Kidd
Central Electric Power Cooperative
PO Box 1455
Columbia, South Carolina 29202

CHICORA RESEARCH CONTRIBUTION 287

Chicora Foundation, Inc.
PO Box 8664
Columbia, SC 29202-8664
803/787-6910
Email: chicora@bellsouth.net
www.chicora.org

February 7, 2000

This report is printed on permanent paper ∞

ABSTRACT

This study reports on an intensive archaeological survey of a 7.1 mile long transmission line corridor in the central portion of Bamberg County, South Carolina. The corridor, a maximum of 75 feet in width, is to be used by Central Electric Power Cooperative for the construction of a new 115kV transmission line running from the existing Santee Cooper line off Cedar Pond Road (S-59) on the northeast side of Lemon Creek to the Spring Branch Substation off Bethel Road (S-541) in the west central portion of the county. The corridor consists of generally level lands, much of which runs through swamps and poorly drained swales. Vegetation is a mixture of cultivated tracts on the higher (and drier) elevations and woods in the lower areas.

This line will consist of a series of single wood poles, about 50 feet in height. Construction of this line will require the clearing and grubbing of the corridor, followed by augering for placement of poles and laying the wire. Maintenance of the line will consist of periodic bushhogging. All of these activities have the potential to affect archaeological and historical sites and this survey was conducted to identify and assess archaeological and historical sites which may be in the project corridor.

Consultation with the S.C. Department of Archives and History revealed no National Register properties in the immediate area. Likewise, an investigation of the site files at the S.C. Institute of Archaeology and Anthropology revealed no previously recorded archaeological sites in the immediate corridor vicinity.

The State Historic Preservation Office required a geophysical investigation of the corridor crossing the Little Salkehatchie River. This study was conducted by Geonetics Corporation of Boone, North Carolina and included a survey of the floodplain geomorphology and the coring of selected landforms to describe the sedimentology and stratigraphy of the landforms. The scope was designed to determine if the floodplain contained elevated landforms that would have been occupied by Native Americans and whether these landforms contain sedimentary deposits favorable for the preservation of cultural context and archaeological stratigraphy.

The archaeological survey of the tract incorporated shovel testing at 100-foot intervals on the higher, better drained soils and 200-foot interval shovel testing on the lower, more poorly drained soils. In the area where geophysical investigations had been requested, shovel testing was conducted at 50 foot intervals. In areas of standing water no shovel testing was attempted. A single transect was run down the center of the 75-foot wide corridor. In areas of recent cultivation a pedestrian survey was also undertaken. All shovel test fill was screened through ¼-inch mesh and the shovel tests were backfilled at the completion of the study.

The geophysical study identified two areas where landforms and paleosols were present which might support archaeological deposits. In these areas shovel testing was increased to every 50-feet and was carried to a maximum depth of 3.0 feet or until water was hit. No archaeological remains were found within these deposits by the shovel testing.

The failure to identify archaeological remains in these deposits is not surprising. The floodplains of the Little Salkehatchie do not offer any resources which are not available in higher, better drained, and immediately adjacent locales — areas which are not subjected to the flooding and which do not consist primarily of wet soils. No further subsurface investigation is recommended along this floodplain corridor.

Elsewhere the archaeological study identified two sites and one isolated find. Site 38BM117 is a

scatter of historic remains, while 38BM118 represents a small prehistoric site. Both sites are recommended as not eligible for inclusion on the National Register of Historic Places. The isolated find was a single flake, also recommended not eligible.

Because of the nature of the project the area of potential effect seems limited to the area of the corridor or the area immediately adjacent to it. As a result, we examined only the corridor and immediately adjacent areas for architectural sites and structures. Three were identified. Two, U/09/0000/0970119 and U/09/0000/5170121, are houses dating to the first quarter of the twentieth century and both have been extensively altered. The third resource, U/09/0000/0970120, is a structure which housed a cotton gin during the first half of the twentieth century. This building is in collapse and is abandoned. None of the ginning equipment is still present. All three structures lack integrity and are recommended as not eligible for inclusion on the National Register.

It is possible that archaeological remains may be encountered in the corridor during construction. Construction crews should be advised to report any discoveries of concentrations of artifacts (such as bottles, ceramics, or projectile points) or brick rubble to the project engineer, who should in turn report the material to the State Historic Preservation Office or to Chicora Foundation (the process of dealing with late discoveries is discussed in 36CFR800.13(b)(3)). No construction should take place in the vicinity of these late discoveries until they have been examined by an archaeologist and, if necessary, have been processed according to 36CFR800.13(b)(3).

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGMENTS

I appreciate the support and assistance of Central Power Electric Cooperative, as well as their commitment and concern for South Carolina cultural resources. I also want to thank Mr. Robert Kidd for his continued support and patience.

I want to thank Mr. Tom Covington and Ms. Autumn Perkins of our staff who were responsible for assembling the background information for this project. Ms. Rachel Campo also conducted the field survey. I appreciate their dedication and thoroughness. The geophysical study was conducted by Mr. Keith C. Seramur, P.G., Geonetics Corporation, and I appreciate his assistance, patience explaining geological issues, and timeliness.

In addition, I appreciate the assistance and cooperation of the staff of the S. C. Institute of Archaeology and Anthropology, particularly Mr. Keith Derting and Ms. Sharon Pekrul. Both went out of their way to make our job easier and the final product more complete and useful. Finally, we also appreciate the time and effort spent by both Dr. Tracy Power and Mr. Dan Vivian, of the S.C. Department of Archives and History, to assist us in the review of previous architectural surveys and National Register sites in the project area.

INTRODUCTION

This intensive archaeological survey of the proposed Central Electric Power Cooperative 115kV transmission line in Bamberg County was conducted by Ms. Rachel Campo of Chicora Foundation, Inc. for Mr. Robert Kidd of Central Electric.

The project corridor, approximately7.1 miles in length, begins in the central portion of Bamberg County about 6 miles south-southeast of Bamberg, ending south of Springtown, in southwestern Bamberg County (Figure 1). The corridor for the transmission line is proposed to be about 75 feet in width, all of it situated on new alignment. This project will use single wood poles, each about 50 feet in height above the ground. A series of four wires will be strung on the poles (Figure 2).

The survey corridor begins at an existing Santee-Cooper powerline located off Cedar Pond Road (S-59) and runs parallel to Cedar Pond Road for about 1,800 feet. It then turns to the south and continues for 600 feet, at which point it again turns to the east. The corridor runs through a wooded area and opens onto an old field, running to Ehrhardt Road (S-23) for a distance of about 1,400 feet. After crossing Ehrhardt Road, the corridor continues to run roughly east through a fallow field, a wooded area, and small swamp for about 11,600 feet. At this point the line turns to the north, continuing through a wooded area and then another fallow field for 1,400 feet before crossing Hadwin Road. From there it continues north through a fallow field for 1,500 feet, crossing a deep drainage ditch and continuing through a wooded tract for 1,000 feet before crossing Orange Grove Road (S-41).

The corridor runs parallel to the northwest side of Orange Grove Road for about 3,000 feet through the Little Salkehatchie River. In this vicinity it is immediately adjacent to the road right-of-way, an area which is already somewhat disturbed by road construction.

On the northeast side of the Little Salkehatchie River the line turns east and crosses Orange Grove Road again, running through a steep wooded area that slopes into a wetland adjacent to a pond, and slopes up again for about 1,050 feet before crossing Clear Pond Road (S-59). The corridor continues to run east for another 3.5 miles through planted fields, forested areas, areas of recently logged timber, wetlands, pastures, and across SC 601.The line then turns slightly to the north and continues for about 3,800 feet, running parallel to the north side of Bethel Road (S-541) for about 1,400 feet and crossing fields of planted pines and wetlands. The line turns southeast for 600 feet and then, again, to the north, continuing for 1,200 feet and ending at the Spring Branch Substation on the north side of Bethel Road.

The corridor consists of a variety of landforms and vegetation types including wetlands, pastures, agricultural fields, cleared areas, planted pines, and mixed pine/hardwood forests. The corridor crosses the Little Salkehatchie and Lemon Branch, as well as crossing over much low, wet topography — much of which is very poorly drained and characterized by standing water.

The corridor, as previously mentioned, is intended to be used as a power line right of way. Landscape alteration, primarily clearing and grubbing and subsequent operation of equipment to place the poles, as well as future maintenance, will cause considerable damage to the ground surface and any archaeological resources which may be present in the survey area.

Construction, operation, and maintenance of the powerline may also have an impact on historic resources in the project area. Although the project is not anticipated to remove any structures, powerlines (as well as other above grade projects) may detract from the visual integrity of historic properties, creating what many consider discordant surroundings. Because of the

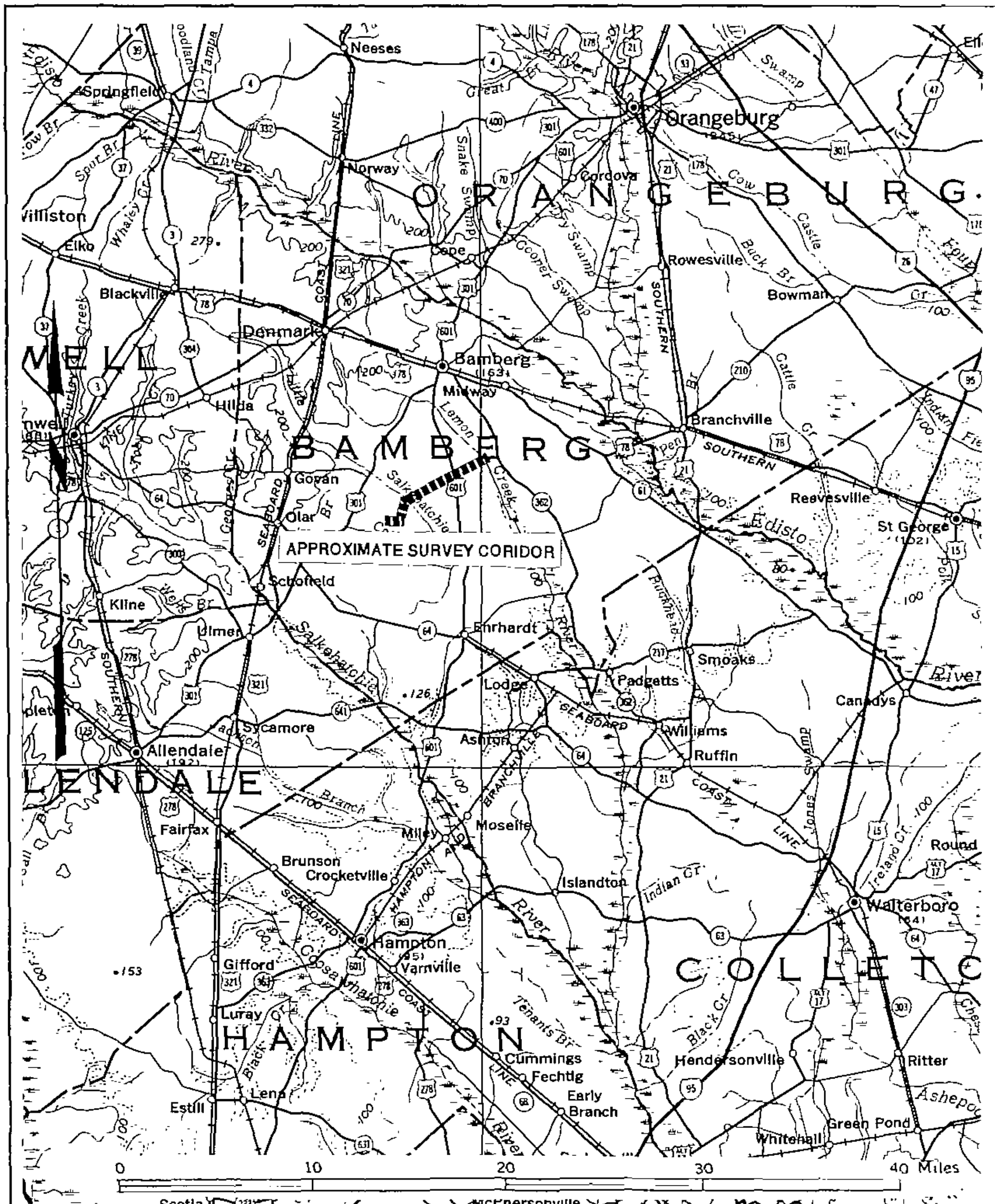

Figure 1. Location of project corridor in Bamberg County, South Carolina (base map is USGS South Carolina 1:50,000).

nature of the poles being used on this project, this impact is anticipated to be very minor and to affect only properties which may be either on or immediately adjacent to the proposed powerline. As a result, this survey only reports on structures that are within or immediately adjacent to the proposed undertaking.

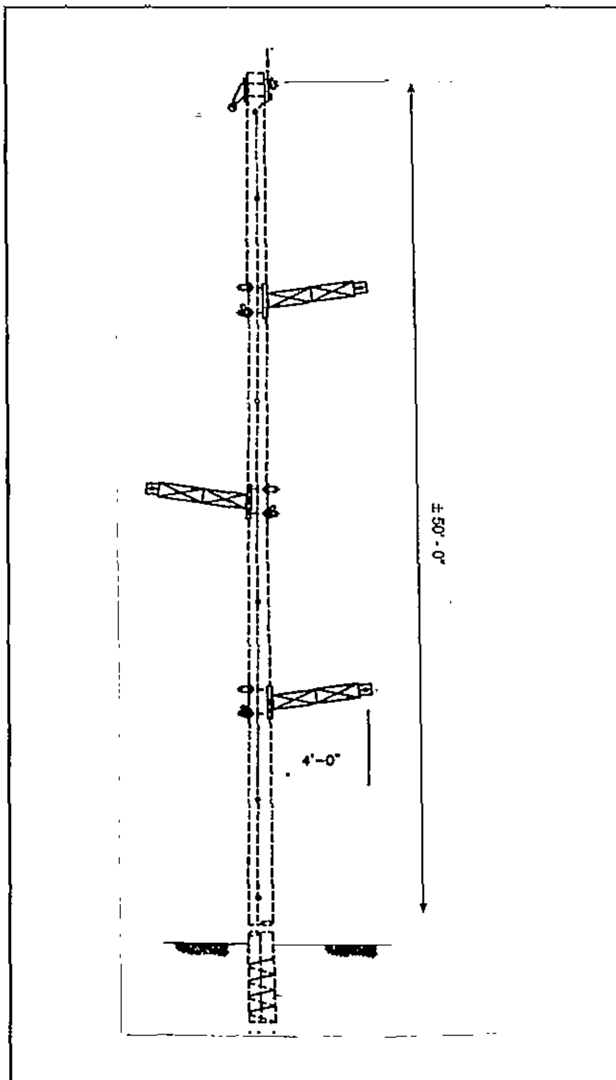

Figure 2. Typical drawing of proposed structure.

This study, however, does not consider any future secondary impact of the project, including increased or expanded commercial or industrial development of this currently rural section of the South Carolina coastal plain.

We were requested by Mr. Robert Kidd of Central Electric Power Cooperative to submit a cost proposal for an intensive survey of the project corridor on September 28, 1999. This proposal was submitted on October 1, 1999. On October 10, Mr. William Green of the State Historic Preservation Office (SHPO) stipulated that deep testing using mechanical equipment be undertaken in the floodplain of the Little Salkehatchie River. This level of investigation, however, was not possible since Central Electric Power Cooperative did not have the legal authority to undertake such extensive work on the proposed easement. Moreover, the federal agency responsible for this work, the Rural Electric Service, did not believe that the SHPO had made an appropriate case that such extensive work was necessary or required (Bob Quigel, personal communication 1999). Eventually an agreement was devised wherein a geophysical study would be conducted to identify areas where there might be a potential for the identification of buried archaeological deposits and these areas would then be subjected to more intensive shovel testing in an effort to determine if, in fact, archaeological materials were actually present. The geophysical study would be conducted by Mr. Keith C. Seramur, P.G. of Geonetics Corporation in Boone, North Carolina. The proposal for the archaeological and geophysical study was approved by Central Electric on October 14, 1999. The geophysical work was approved by the SHPO on November 4.

These investigations incorporated a review of the site files at the South Carolina Institute of Archaeology and Anthropology. No previously recorded sites were recorded in the immediate project area. In addition, the master topographic maps at the South Carolina Department of Archives and History were checked to locate any NRHP buildings, districts, structures, sites, or objects, or structures surveys in the study area. There were no NRHP properties or structures surveys recorded for the project area.

Archival and historical research was limited to a review of secondary sources available in the Chicora Foundation files, as well as research at the South Caroliniana Library and the Thomas Cooper Map Repository.

The geophysical survey of the Little Salkehatchie was conducted November 22-23, 1999 by Mr. Keith Seramur, P.G. and his preliminary results were provided to Chicora on November 26 as a guide to our shovel testing program. The archaeological survey, which was designed to identify prehistoric or historic resources which may be within the project corridor was conducted December 3-5, 1999 by Ms. Rachel Campo. Laboratory and report production were conducted at Chicora's laboratories in Columbia, South Carolina on December 8-10, 1999. The final geophysical report was completed on January 18, 2000.

NATURAL ENVIRONMENT

Physiography

The project is situated in central and southwestern Bamberg County (Figure 3). Bamberg is a relatively small county having a roughly triangular shape, situated in the southwestern part of South Carolina. It is separated from Orangeburg County to the northeast by the Edisto River and from Allendale County to the southwest by the Salkehatchie River. Bamberg is bordered to the northwest by Barnwell County and to the southeast by Colleton County.

The topography of the project area consists of nearly level terraces overlooking swamps and the equally level adjacent flood plains. Elevations in the project area range from a high of about 150 feet above mean sea level (AMSL) in the more upland terraces overlooking the swamps to a low of about 105 feet in the floodplains of the Little Salkehatchie River and Lemon Creek — both crossed by the corridor. Elevations in the County range from about 60 feet AMSL along some sections of the Salkehatchie River floodplain to about 350 feet in the north part of the county. Overall, the entire region generally slopes down hill towards the Atlantic Ocean.

Often described as flatwoods, the project corridor crosses an area often characterized by broad flat areas, which consist of a few low ridges and bay depressions. The most common depressions in the Coastal Plain are Carolina bays, usually marshy and oval in shape (Richards 1959:45-46). Water depth varies from shallow lakes to areas with a preponderance of peat and herbaceous species (Barry 1980:131-13). Edmond Ruffin, a mid-nineteenth century observer, commented that these features provided good pasturage for cattle (Mathew 1992:210).

A number of rivers, creeks, and swamps join together to form a dendritic network that impeded much of the early settlement in this region. Major rivers within the area are the Salkehatchie, Little Salkehatchie, and Edisto. Swamps and inland bays are found associated with most of these rivers and, again, are common to a number of the counties in this region. These include Little Swamp and Brier Creek found in other sections of the county, as well as Lemon Creek in the project area. The better soils are typically in areas that are slightly sloping toward drainageways. It is in these areas that most cultivation and development has taken place. These soils, however, merge outward onto wide flats that are nearly level and only occasionally broken by slight elevated areas and may lower swales or bays. Soils in these area are generally poorly drained loamy sands and the typical vegetation is usually mesic or swampy, often characterized by bay trees.

Geology and Soils

The geology is characteristic of the Coastal Plain. The parent materials of the soils are marine or fluvial deposits which consist of varying amounts of sands, silts, and clays. There are two primary geologic formations in the project area, deposited at different periods during alternating transgression and recession of the ocean: the Sunderland marine terrace occupies the southeastern two-thirds of the county, while the upper third is considered part of the Coharie. The Sunderland, in which the project falls, ranges in elevation from 100 to 170 feet AMSL. This terrace averages about 20 miles in width. The Coharie terrace, from 170 to 215 feet in elevation, is much flatter and far less dissected than those below it, including the Sunderland. (Cook 1936:9).

The project corridor crosses three soil associations, the Alluvial land-Swamp Association, the Lakeland-Eustis Association, and the Norfolk-Goldsboro-Raines Association. The first consists of very poorly drained soils found in the stream floodplains, such as along the Little Salkehatchie River and Lemon Creek. The Lakeland-Eustis Association consists of droughty, nearly level to sloping sand soils found bordering the swamps. Finally, the

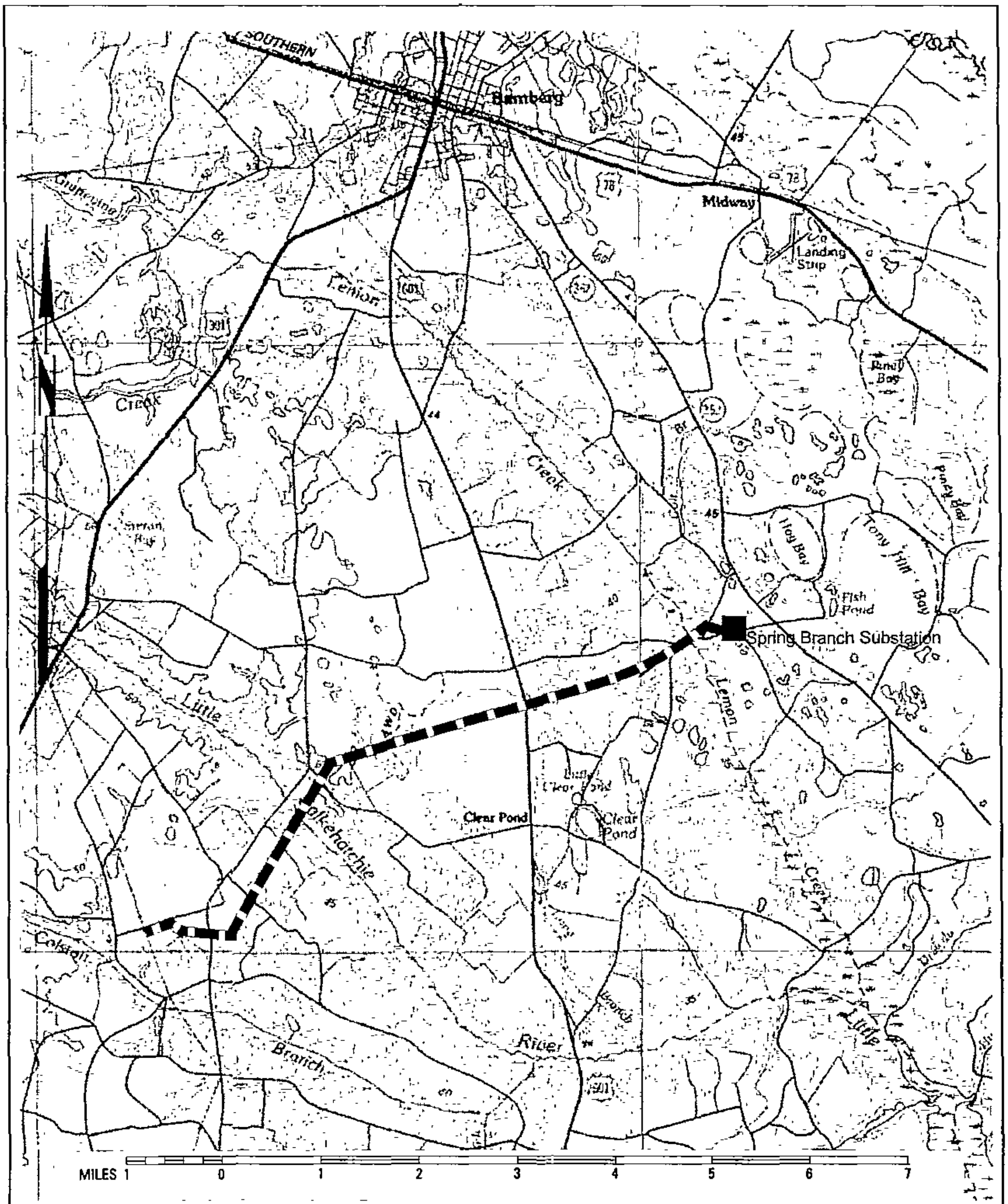

Figure 3. Area of survey corridor (basemap is St. George, S.C. and Barnwell, S.C. 1:100,000).

Norfolk-Goldsboro-Raines Association consists of soils varying from well drained to poorly drained. They are found in the flatwoods areas, typically between drainages. These broad, nearly level undulating plains contain Carolina bays and a variety of sloughs or troughs — all of which are poorly drained. Outlets, where present, are poorly defined. This association, which accounts for about a third of the county, comprises nearly 70% of the survey corridor.

The proposed transmission line crosses 10 soil series (Crow et al. 1966). A useful characterization of the soils is by capability classification, which is the grouping of soils to show their suitability for cultivation and woodland species. The soils are typically grouped by their limitations (such as erosion or wetness). Soils from five of the seven classifications are found in the corridor, although most have moderate through very severe limitations. The primary limitations are wetness, typical of the Coxville (with a seasonal water table 0-1.5 foot below the surface),Rains and Portsmouth (with a seasonal water table from 0-1 foot below the surface), and Swamp (with frequent flooding) soils. In addition, there are other soils, such as the Goldsboro, which exhibit seasonal water tables within the upper 2.0 feet of the soil.

The soils in the project area closely parallel the physiographic regions crossed by the corridor: the upper elevations with generally well drained, sandy soils; and the low swampy areas of the Flatwoods and drainages where the water table may be within a few feet of the ground level. Few historic or prehistoric sites are expected on the very wet soils. Historic occupation, especially during the late nineteenth and early twentieth centuries, is expected on upland or sloping, well drained soils suitable for agriculture. Earlier historic sites may occasionally be found on the margins of swamp bottoms, but are not common in this area. Prehistoric sites are expected to be uncommon in the upland areas remote from a water source, and instead are more likely to occur adjacent to the hardwood bottom swamps.

Table 1.
Soils and Capability Classifications for the Survey Corridor

Capability Class I — *Few Limitations*	
Norfolk loamy sand	WD
Ruston loamy sand	WD
Capability Class II — *Moderate Limitations*	
Goldsboro loamy sand	MWD
Norfolk sands	WD
Capability Class III — *Severe Limitations*	
Coxville sandy loam	PD
Portsmouth loam	VPD
Lakeland sand	WD
Vaucluse sand	WD
Capability Class IV — *Severe Limitations*	
Rains loamy sand	PD
Capability Class VII — *Very Severe Limitations*	
Swamp	flooded

WD = well drained, MWD = moderately well drained, PD = poorly drained, VPD = very poorly drained

The poorly drained and very poorly drained soils have seasonal high water tables ranging from 0 to 1.5 feet below the surface. For the purpose of this study they are lumped together and account for about 60% of the corridor. These soils are most commonly associated with wooded tracts or bays and ponding frequently occurs. Although these soils may be incorporated into cultivated fields if drainage ditches are present, ponding may still be evident.

The well drained to moderately well drained soils have seasonal high water tables ranging from 1.5 to 5 feet below the surface and together account for about 40% of the soils in the study tract. Most of these better drained soils are found either where fields have been opened for cultivation or on wooded ridge tops between drainages.

At the time of Mills review of the area's agriculture, he observed that the bulk of the cultivation was taking place in the uplands. These soils were "sand, bottomed on clay," and as a result their intensive agriculture was "destructive." He suggested either manuring the uplands, or even better, draining and opening the swamp lands for cultivation. There he felt, "an inexhaustible soil would . . . be obtained, and the county rendered more healthy" (Mills 1972:364 [1826]). In fact he favored planting cotton on the reclaimed swamp soil and using the sandier upland soils for provision crops.

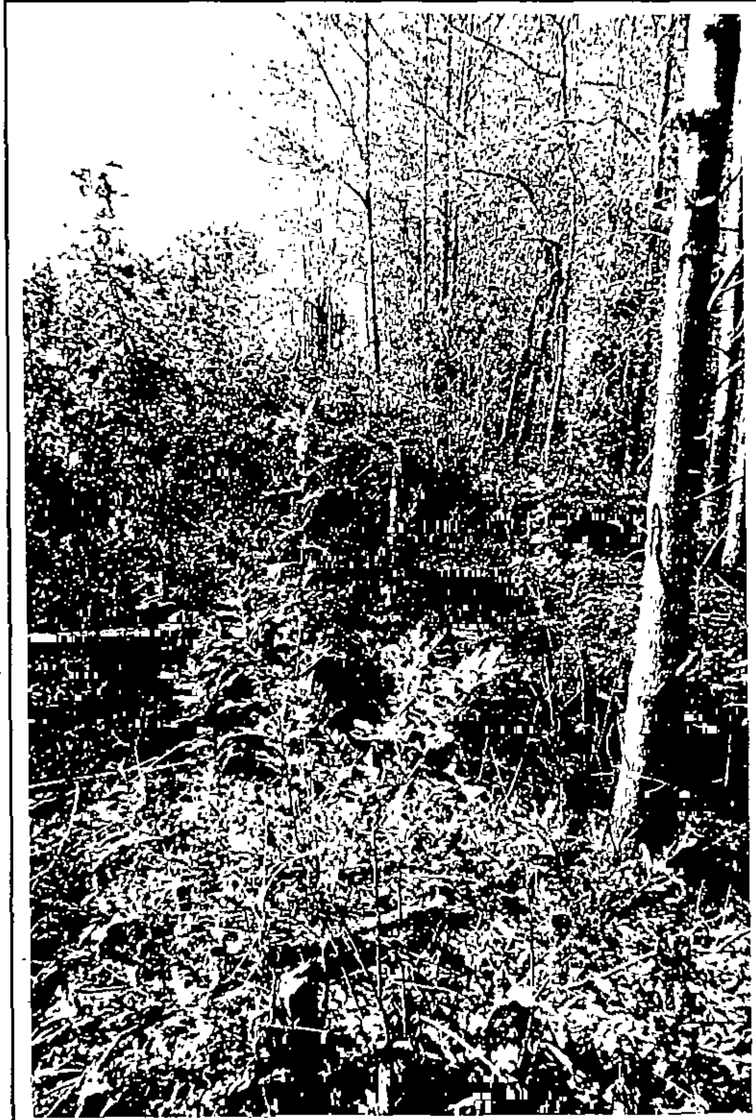

Figure 4. Corridor crossing edge of Carolina bay.

Climate

The general climate of the area is characterized by mild humid conditions. This climate is influenced by the warm Gulf Stream, as well as by the Appalachian mountains which block the coldest air masses. Other factors include latitude, elevation, distance from the ocean, and location with respect to the average tracts of migratory cyclones. Day to day weather is controlled primarily by the movement of pressure systems across the nation. However, during the summer months there are few complete exchanges of air masses because tropical maritime air persists for extended periods (Crow et al. 1966).

The average annual precipitation in the county averages about 45 inches and is unevenly distributed throughout the year, with 28.2 inches occurring from April through October, which is the primary growing season (Crow et al. 1966:100-101).At the time of the survey heavy rains had increased flooding in some areas and may have contributed to the wetter than normal soils, in spite of a droughty summer.

The climate, according to Mills (1972:362 [1826]), was "pleasant" and the "situations immediately near the water courses being the only spots subjecting the inhabitants to bilious fevers." The annual average temperature in Bamberg is 76°F, and the average monthly temperature ranges from 59°F in December to 92°F in July. Frozen precipitation occurs only one to three times a year during the winter season. The abundant supply of warm, moist and relatively unstable air produces frequent scattered showers and thunderstorms in the summer. Severe weather usually means violent thunderstorms, tornadoes, and hurricanes. The tropical storm season is in late summer


Figure 5. Corridor crossing low woods with second growth vegetation.

and early fall, although storms may occur as early as May or as late as October (Baldwin 1973). Heavy rains and high winds occur with tropical storms about once every six years. Storms of hurricane intensity are much more infrequent. Notable droughts have occurred twice in modern times; in 1925 and 1954. Typically a serious drought may occur once every fifty years. Less severe dry periods have occurred more often, normally in late spring or in autumn (Crow et al. 1966:101-102).

Floristics

There are two major categories of plant communities, based primarily on topographic location, which exist in the project area. The first category consists of upland vegetation. Supported here are a mixture of coniferous and deciduous forests dominated by pines and broadleaf taxa such as upland oaks, sweetgum, hickories, and various understory species. Incorporated may be small upland depressions and drainages, which contain more hydric species.

Portions of the upland area were found to contain pine forest, typically found on soils of low fertility, high acidity, and excessive drainage. Most often these areas have been subjected to extensive disturbance, including repeated logging operations, and the pine represent an early stage of revegetation. A few areas of hardwood forest exist in the project area, where oaks, maple, sweetgum, black gum, and mockernut hickory are prevalent. More common, however are mixed forests, containing both pines and hardwoods.

Lowland forests, which account for the second category, are located on the floodplains and swamps of the corridor. These floodplain soils are forested with bald cypress, gum, sycamore, water hickory, lowland oaks, soft maples, willows, and other herbaceous species.

In the early nineteenth century Mills observed that:

> extensive forests of the finest pine timber cover this whole country in the high lands. On the clay lands and bottoms, the oak, hickory, poplar, gum, cypress, cedar, dogwood, sassafras, &c. abound: in the swamps the cypress is very plenty (Mills 1972:361 [1826]).

Mills also observed that the major use of these forest resources was construction, also noting that "large quantities of pine timber squares, are taken down the Edisto in rafts, to Charleston, every year. The Edisto timber brings a higher price than any other brought to market" (Mills 1972:362 [1826]). Edmund Ruffin, passing through the region in 1843 observed that:

> the forests of gigantic long leaved pine, such as may be seen in a few

Figure 6. Corridor crossing cultivated field, at the time of the survey in corn stubble.

The proportion of the county under cultivation has declined steadily during the twentieth century. In 1930 slightly over a third of the county was in farmland. By 1970 that had dropped to just over a fifth of the county. Today even less is farmed and more has been turned over the planted pine. On the 7.1 mile long survey corridor, only about 0.96 mile, or 14%, of the land is in seasonally fallow fields or active cultivation (the only active cultivation at the time of the survey was winter rye). About 4.42 miles, or 62.3%, consisted primarily of coniferous and deciduous trees including pines, oaks, sweetgums, and hickories. In addition, the wooded areas consisted of a very thick understory of plants including various shrubs, vines, and herbaceous species. About 1.72 miles, or 24.2%, consisted of swamp.

places, or of which the appearance may be inferred by the few scattered trees yet spared by the fires, have a degree of beauty & even sublimity which is rarely surpassed. And even if these noble trees were not highly valuable, as they are, for furnishing the best of timber — & if their covers were not conducive to health, still, covering as they usually do lands not deemed worth cultivation, they ought to be preserved from useless and unprofitable destruction, if only to make the most splendid & extensive forest scenery in the world (Mathew 1992:140-141).

He went on to complain about the frequent fires set to encourage "the scanty grazing better," as well as the destructive and wasteful actions of timber cutters. He also comments that the process of firing the flatlands would have resulted in creating a prairie in this region, except that the soils are "too poor & the soil unfriendly to grass . . . to encourage its growth more than that of trees" (Mathew 1992:141).

Prehistoric Environment

A reconstruction of paleoenvironmental features has gradually emerged within the past several decades and is based on the work of Whitehead (1965, 1967, 1972, 1973) and Watts (1970, 1975, 1980). Unfortunately, our understanding of environmental change is general and is based almost entirely on pollen analysis of lake sediments and buried organic layers situated in Piedmont areas outside South Carolina. The pollen studies give evidence of vegetational changes which in turn provide suggestions concerning climatic change. These studies can be important to the archaeologist because they allow inferences to be drawn on the nature of the cultural-environmental interactions, such as the adaptive shifts human populations made to counter ecological shifts. It is recognized that these inferences must be based on the paleoenvironment, not the extant environment.

Based largely on work from southeastern Virginia and North Carolina, Whitehead (1965) has employed a tripartite division of the preceding 25,000 years: Full Glacial (25,000 - 15,000 B.P.), Late Glacial (15,000 - 10,000 B.P.), and Post-Glacial or Holocene (10,000 B.P. - present).

During the Full Glacial the Coastal Plain was boreal, although the vegetation was sparse, which suggests a relatively dry climate. Voorhies (1974), based on a paleontological assemblage from east-central Georgia, suggests a cool, moist climate instead. Watts' (1980) work from White Pond at the edge of the Inner Coastal Plain, found jack pine, red spruce, and herbs, which appear to reflect a boreal forest climate. During the Late Glacial period there was a gradual change to a hemlock-northern hardwoods forest type and eventually to a modern condition. From White Pond, Watts (1980) identified a forest dominated by oak, hickory, beech, and ironwood and interprets this assemblage as a mesic deciduous forest typical of a cool and moist environment.

The mesic deciduous forest began to change early in the Holocene and was replaced by a more xeric forest comprised of modern flora. Again from White Pond, Watts (1980) notes the rapid loss of hickory, beech, and ironwood after 9,500 B.P. with the equally rapid rise of southern pine species. The oak species remain, and sweet gum and tupelo are found. An essentially modern flora is postulated by Whitehead (1965) and Watts (1971) by 5,000 B.P. with the spread of oak-hickory forests.

Of considerable interest to the reconstruction of the environment of the Late Woodland and early Historic periods are the descriptions of the early explorers and surveyors. One of the earliest descriptions is by John Lawson during his 1701 journey through the interior of South Carolina. Lawson left Charleston on December 18, 1700 and fifty-nine days later, arrived at the English settlements on the Pamlico River. During this trip Lawson passed to the west of Sumter County and observed the High Hills of Santee from the west bank of the Santee River swamp. Lawson stated he:

> came to the most amazing Prospect I had seen since I had been in *Carolina*; we travell'd by a Swamp-side, which Swamp I believe to be no less than twenty miles over, the other Side being as far as I could well discern, there appearing great Ridges of Mountains . . . (Lefler 1967:32).

In addition, Lawson describes the swamp areas as "extraordinarily rich, and the Runs of Water well stor'd with Fowl" and the land as well "extraordinarily rich, black Mould" (Lefler 1967:32). That night Lawson and his fellow travelers were awoken by the "hideous Noise" or "Musick" which resulted from the "endless Numbers of Panthers, Tygers, Wolves, and other Beasts of Prey, which take this Swamp for their Abode in the day, coming in whole Droves to hunt the Deer in the Night" (Lefler 1967:33). Lawson noted that the next morning his Indian guide, Santee Jack, "kill'd 15 Turkeys this Day; there coming out of the Swamp, (about sun-rising) Flocks of these Fowl, containing several hundreds in a Gang, who feed upon the acorns, it being most Oak that grow in these Woods" (Lefler 1967:33).

This view suggests that the hardwood swamp areas of the Inner Coastal Plain were highly productive hunting areas. In fact, Santee Jack told Lawson's group that they should not stop until they arrived at the swamp edge because the hunting away from the swamp (presumably in the Inner Coastal Plain's Flatwoods area) "was not good" (Lefler 1967:31-32). This offers some minor ethnographic support for the previously discussed swamp ecology and significance.

An analysis of early historic plat records provides additional information helpful for a thorough understanding of the area's ecology. Plummer reconstructed forest types in Georgia, using original eighteenth century land survey maps which show boundary trees. He notes that:

> species in the Coastal Plain of southeast Georgia numbered 8-14 kinds although lowlands probably supported more numerous taxa. The frequency of pines ranged from 71-

> 99%; gum trees, either black or tupelo, were second ranked, followed by red bay and thin cypress . . . . The vegetation was pine-oak-hickory at a ratio of about 91:1:0.5 occurring on sandy sites and oaks, pines, sweet gum, hickory at about 42:20:7.6 on clayey sites (Plummer 1975:16).

Consequently, both the currently available data and this brief review of historic sources agree that the four county area might be defined by low swamp bottomlands which contain a wide variety of important subsistence items, and a sandy, rolling upland area which contains only minor subsistence resources because of its pine vegetation and rapidly permeable soils. It is probable that this dichotomy existed by 2,000 B.C. and perhaps as early as 5,000 B.C. (Haag 1975).

PREHISTORIC AND HISTORIC SYNOPSIS

The Prehistoric Period

The Paleoindian period, lasting from 12,000 to 8,000 B.C., is evidenced by basally thinned, side-notched projectile points; fluted, lanceolate projectile points, side scrapers; end scrapers; and drills (Coe 1964; Michie 1977; Williams 1968). The Paleoindian occupation, while widespread, does not appear to have been intensive. Artifacts are most frequently found along major river drainages, which Michie interprets to support the concept of an economy "oriented towards the exploitation of now extinct mega-fauna" (Michie 1977:124).

Unfortunately, little is known about Paleoindian subsistence strategies, settlement systems, or social organization. Generally, archaeologists agree that the Paleoindian groups were at a band level of society (see Service 1966), were nomadic, and were both hunters and foragers. While population density, based on the isolated finds, is thought to have been low, Walthall suggests that toward the end of the period, "there was an increase in population density and in territoriality and that a number of new resource areas were beginning to be exploited" (Walthall 1980:30).

The Archaic period, which dates from 8000 to 2000 B.C., does not form a sharp break with the Paleoindian period, but is a slow transition characterized by a modern climate and an increase in the diversity of material culture. Associated with this is a reliance on a broad spectrum of small mammals, although the white tailed deer was likely the most commonly exploited mammal. The chronology established by Coe (1964) for the North Carolina Piedmont may be applied with little modification to the South Carolina coastal plain and piedmont. Archaic period assemblages, exemplified by corner-notched and broad-stem projectile points, are fairly common, perhaps because the swamps and drainages offered especially attractive ecotones.

In the Coastal Plain of South Carolina there is an increase in the quantity of Early Archaic remains, probably associated with an increase in population and associated increase in the intensity of occupation. While Hardaway and Dalton points are typically found as isolated specimens along riverine environments, remains from the following Palmer phase are not only more common, but are also found in both riverine and interriverine settings. Kirks are likewise common in the coastal plain (Goodyear et al. 1979).

The two primary Middle Archaic phases found in the coastal plain are the Morrow Mountain and Guilford (the Stanly and Halifax complexes identified by Coe are rarely encountered). Our best information on the Middle Woodland comes from sites investigated west of the Appalachian Mountains, such as the work in the Little Tennessee River Valley. The work at Middle Archaic river valley sites, with their evidence of a diverse floral and faunal subsistence base, seems to stand in stark contrast to Caldwell's Middle Archaic "Old Quartz Industry" of Georgia and South Carolina, where axes, choppers, and ground and polished stone tools are very rare.

The Late Archaic is characterized by the appearance of large, square stemmed Savannah River projectile points (Coe 1964). These people continued the intensive exploitation of the uplands much like earlier Archaic groups. The bulk of our data for this period, however, comes from work in the Uwharrie region of North Carolina.

The Woodland period begins by definition with the introduction of fired clay pottery about 2000 B.C. along the South Carolina coast (the introduction of pottery, and hence the beginning of the Woodland period, occurs much later in the Piedmont of South Carolina). It should be noted that many researchers call the period from about 2500 to 1000 B.C. the Late Archaic because of a perceived continuation of the Archaic lifestyle in spite of the manufacture of pottery.

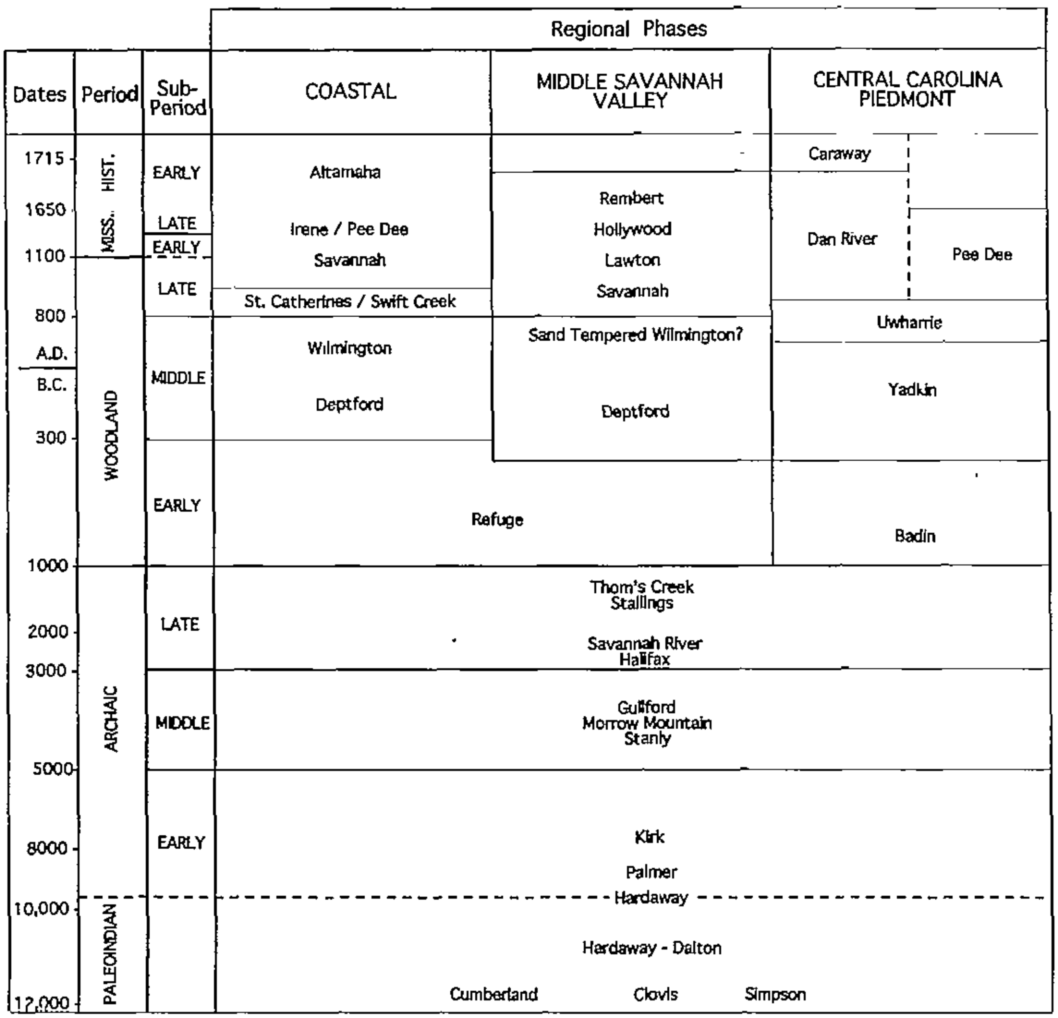

Figure 7. Cultural periods along the coast of South Carolina.

Regardless of terminology, the period from 2500 to 1000 B.C. is well documented on the South Carolina coast and is characterized by Stallings (fiber-tempered) pottery (see Figure 7 for a synopsis of Woodland phases and pottery designations). The subsistence economy during this early period was based primarily on deer hunting and fishing, with supplemental inclusions of small mammals, birds, reptiles, and shellfish.

Like the Stallings settlement pattern, Thom's Creek sites are found in a variety of environmental zones and take on several forms. Thom's Creek sites are found throughout the South Carolina Coastal Zone, Coastal Plain, and up to the Fall Line. The sites are found into the North Carolina Coastal Plain, but do not appear to extend southward into Georgia.

In the Coastal Plain drainage of the Savannah River there is a change of settlement, and probably subsistence, away from the riverine focus found in the Stallings Phase (Hanson 1982:13; Stoltman 1974:235-236). Thom's Creek sites are more commonly found in the upland areas and lack evidence of intensive shellfish collection. In the Coastal Zone large, irregular shell middens; small, sparse shell middens; and large "shell rings" are found in the Thom's Creek settlement system.

The Deptford phase, which dates from 1100 B.C. to A.D. 600, is best characterized by fine to coarse sandy paste pottery with a check stamped surface treatment. The Deptford settlement pattern involves both coastal and inland sites.

Inland, sites such as 38AK228-W, 38LX5, 38RD60, and 38BM40 indicate the presence of an extensive Deptford occupation on the Fall Line and the Coastal Plain, although sandy, acidic soils preclude statements on the subsistence base (Anderson 1979; Ryan 1972; Trinkley 1980b). These interior or upland Deptford sites, however, are strongly associated with the swamp terrace edge, and this environment is productive not only in nut masts, but also in large mammals such as deer. Perhaps the best data concerning Deptford "base camps" comes from the Lewis-West site (38AK228-W), where evidence of abundant food remains, storage pit features, elaborate material culture, mortuary behavior, and craft specialization has been reported (Sassaman et al. 1990:96-98).

Throughout much of the Coastal Zone and Coastal Plain north of Charleston, a somewhat different cultural manifestation is observed, related to the "Northern Tradition" (e.g., Caldwell 1958). This recently identified assemblage has been termed Deep Creek and was first identified from northern North Carolina sites (Phelps 1983). The Deep Creek assemblage is characterized by pottery with medium to coarse sand inclusions and surface treatments of cord marking, fabric impressing, simple stamping, and net impressing. Much of this material has been previously designated as the Middle Woodland "Cape Fear" pottery originally typed by South (1976). The Deep Creek wares date from about 1000 B.C. to A.D. 1 in North Carolina, but may date later in South Carolina. The Deep Creek settlement and subsistence systems are poorly known, but appear to be very similar to those identified with the Deptford phase.

The Deep Creek assemblage strongly resembles Deptford both typologically and temporally. It appears this northern tradition of cord and fabric impressions was introduced and gradually accepted by indigenous South Carolina populations. During this time some groups continued making only the older carved paddle-stamped pottery, while others mixed the two styles, and still others (and later all) made exclusively cord and fabric stamped wares.

The Middle Woodland in South Carolina is characterized by a pattern of settlement mobility and short-term occupation. On the southern coast it is associated with the Wilmington phase, while on the northern coast it is recognized by the presence of Hanover, McClellanville or Santee, and Mount Pleasant assemblages. The best data concerning Middle Woodland Coastal Zone assemblages comes from Phelps' (1983:32-33) work in North Carolina. Associated items include a small variety of the Roanoke Large Triangular points (Coe 1964:110-111), sandstone abraders, shell pendants, polished stone gorgets, celts, and woven marsh mats. Significantly, both primary inhumations and cremations are found.

On the Coastal Plain of South Carolina, researchers are finding evidence of a Middle Woodland

Yadkin assemblage, best known from Coe's work at the Doerschuk site in North Carolina (Coe 1964:25-26). Yadkin pottery is characterized by a crushed quartz temper and cord marked, fabric impressed, and linear check stamped surface treatments. The Yadkin ceramics are associated with medium-sized triangular points, although Oliver (1981) suggests that a continuation of the Piedmont Stemmed Tradition to at least A.D. 300 coexisted with this Triangular Tradition. The Yadkin series in South Carolina was first observed by Ward (1978, 1983) from the White's Creek drainage in Marlboro County, South Carolina. Since then, a large Yadkin village has been identified by DePratter at the Dunlap site (38DA66) in Darlington County, South Carolina (Chester DePratter, personal communication 1985) and Blanton et al. (1986) have excavated a small Yadkin site (38SU83) in Sumter County, South Carolina. Research at 38FL249 on the Roche Carolina tract in northern Florence County revealed an assemblage including Badin, Yadkin, and Wilmington wares (Trinkley et al. 1993:85-102). Anderson et al. (1982:299-302) offer additional typological assessments of the Yadkin wares in South Carolina.

Over the years the suggestion that Cape Fear might be replaced by such types as Deep Creek and Mount Pleasant has raised considerable controversy. Taylor, for example, rejects the use of the North Carolina types in favor of those developed by Anderson et al. (1982) from their work at Mattassee Lake in Berkeley County (Taylor 1984:80). Cable (1991) is even less generous in his denouncement of ceramic constructs developed nearly a decade ago, also favoring adoption of the Mattassee Lake typology and chronology. This construct, recognizing five phases (Deptford I - III, McClellanville, and Santee I), uses a type variety system.

Regardless of terminology, these Middle Woodland Coastal Plain and Coastal Zone phases continue the Early Woodland Deptford pattern of mobility. While sites are found all along the coast and inland to the Fall Line, shell midden sites evidence sparse shell and artifacts. Gone are the abundant shell tools, worked bone items, and clay balls. Recent investigations at Coastal Zone sites such as 38BU747 and 38BU1214, however, have provided some evidence of worked bone and shell items at Deptford phase middens (see Trinkley 1990).

In many respects the South Carolina Late Woodland may be characterized as a continuation of previous Middle Woodland cultural assemblages. While outside the Carolinas there were major cultural changes, such as the continued development and elaboration of agriculture, the Carolina groups settled into a lifeway not appreciably different from that observed for the previous 500 to 700 years (cf. Sassaman et al. 1990:14-15). This situation would remain unchanged until the development of the South Appalachian Mississippian complex (see Ferguson 1971).

The South Appalachian Mississippian Period (ca. A.D. 1100 to 1640) is the most elaborate level of culture attained by the native inhabitants and is followed by cultural disintegration brought about largely by European disease. The period is characterized by complicated stamped pottery, complex social organization, agriculture, and the construction of temple mounds and ceremonial centers. The earliest phases include the Savannah and Pee Dee (A.D. 1200 to 1550).

The Historic Period

While the English settled Charleston in 1670, the interior was very slowly settled. In fact, what settlement there was between the Edisto and Salkehatchie rivers primarily followed the Indian paths in the region, primarily a portion of the Creek Trading Path, which ran through the Bamburg area, leading northwest to Augusta and southeast to Parkers Ferry and eventually Charleston. Even the 1731 Township Act ignored the area, although Orangeburg Township to the northeast on the North Edisto River attracted a sizeable proportion of German immigrants (Edgar 1998:55). Regardless, the Bamberg area was sparsely settled, seen by many to be an area of impenetrable swamps.

By the mid to late eighteenth century the area was still sparsely settled, with Orangeburg District, formed in 1768, including Bamberg. Mouzon's 1775 map of North and South Carolina (Figure 8) shows the Bamberg area between "Fine Land" to the east and "Cypress Land" to the west — but with very little settlement.

The American Revolution had little effect on the area, although at war's end, a German soldier, John Joseph Bamberg, who had fought for the American cause, settled in the area and established the family line for which the county was eventually named. In 1785 four counties, Lewisburg, Orange, Lexington, and Winton, were created out of Orangeburg District. Modern-day Bamberg was largely contained with Winton. While the Revolution hardly affected the Bamberg area settlers, its aftermath brought considerable turmoil. Edgar notes that as late as five years after the end of the Revolution, farmers were "just immurging [sic] from the ruins & devastations of the late unnatural war" (Edgar 1998:245) and by 1784 debt weighed so heavily on the area farmers (many of whom had over-invested in slaves and found themselves unable to pay their creditors), that they sacked and burned the Winton courthouse (Edgar 1998:246).

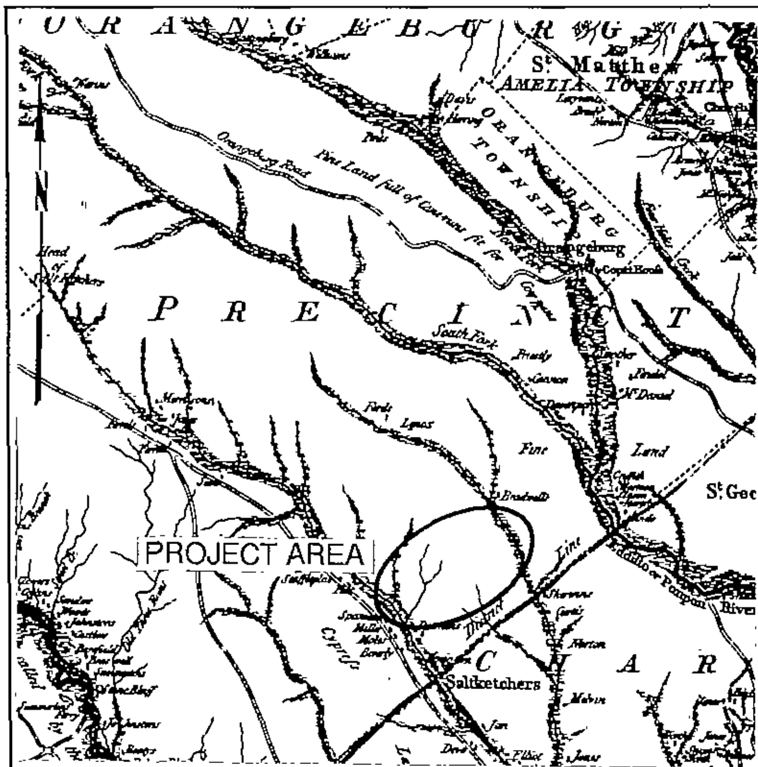

Figure 8. Portion of Mouzon's 1775 map showing the project area.

The 1790 census, for Orangeburg District, reveals that about a third of the population consisted of African American slaves. Although the proportion is not high, the area was apparently not a major producer of cash crops, focusing, instead, on razing and subsistence farming. In spite of this, it appears that the Middle Country, as the region was called, was firmly pro-slavery, or at least every member of the General Assembly from the area was a slave owner (Edgar 1998:258).By 1798 Barnwell District had replaced Winton County.

By 1810 the proportion of slaves had not changed dramatically — they still accounted for about a third of the district's population. But Barnwell boasted few industries. The area ranked 13th (out of 28) in the number of yards of cotton goods produced by its 539 looms. The only other industry reported were its 16 stills, although these were far less than many other districts reported (such as Lexington, with 45).

By 1830 the number of slaves had more than doubled from 4,153 to 8,497, representing fully 44% of the district's population. By this time, too, Barnwell was beginning to participate more fully in the cotton economy. The Whitney gins, or copies, were freely available and the cotton kingdom had spread rapidly into the Middle Country. Mills commented that:

> the price of provisions is beyond their value, owing to there being no corn raised for sale; therefore the planters will not part with it, but at a high price (Mills 1972:360 [1826].

The early nineteenth century also saw the expansion of the railroad into this region. The Bamburg area was developed from a cypress swamp after the Charleston-Hamburg Railroad bought land in the area in 1832, building a water tower for the steam locomotive. The siding, known as Lowery's Turn Out eventually became Bamburg. In spite of this, Mills' *Atlas* still shows the area largely open and unpopulated

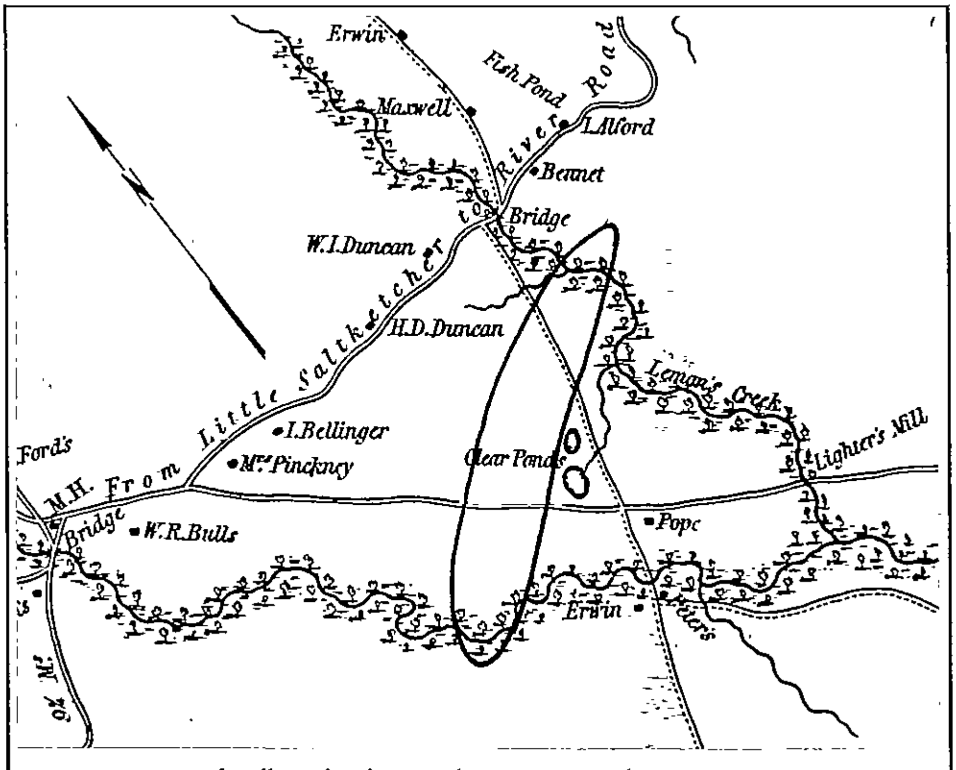

Figure 9. Portion of Mills' *Atlas* showing the project area about 1826.

in the mid-1820s (Figure 9).

By 1850 the slave population in Barnwell District had risen to 52% of the total population (and by 1860 had increased to nearly 57%). There were 1,558 farms, with an average size of 741 acres, less than Charleston (where the average size was 1,051 acres), but far greater than upstate districts like Anderson, where the average size was only 232 acres. Not surprisingly, Barnwell also fell mid-way between the upstate and low country in terms of percent of improved land. On Barnwell's farms about 17% of the acreage was improved for cultivation — more than on the larger low country plantation, but less than on the smaller piedmont farms.

Barnwell was quickly becoming a significant agricultural breadbasket for South Carolina. In 1850 the district ranked fifth (out of 29) in corn production, with a yield of 839,629 bushels, falling behind only Abbeville, Edgefield, Laurens, and Spartanburg. By 1860 Barnwell was producing more corn (1,022,475 bushels) than any other district in the state. Barnwell ranked number one in pea production in both 1850 and 1860. The area was the seventh largest sweet potato producer in 1850, and the fifth in 1860. By 1860 the area was also ranked fifth in orchard products and, in 1860, produced more wine than any other district in the state — 5,619 gallons. It also produced the second largest quantity of cane molasses in 1860 — 4,492 gallons.

Even in terms of cotton production it seems clear that Barnwell was improving. In 1850 the district ranked 12th in cotton production, with a yield of 10,138 bales of cotton. By 1860, however, this has improved dramatically and Barnwell produced the second largest quantity of cotton in South Carolina — 23,490 bales.

It isn't surprising therefore that Barnwell was a significant producer of crops for the Confederacy. Nor is it surprising that the area was chosen as a route by Sherman during his movements through South Carolina. Sherman's Right Wing, consisting of the 17th Corps and the 15th Corps, flooded through the Bamberg area, only momentarily being held up at River's Bridge (at the modern US 601 and SC 641 crossing of the Salkehatchie River) where Confederate troops vainly attempted to stop the advance (Edgar 1998:372; Lower Savannah Regional Planning Council 1975:81).

Between the constant needs of the Confederacy and then Sherman's march through the region, Barnwell staggered after the Civil War. In spite of the cost, many from Barnwell refused to face the fact that African Americans were free. Although the South Carolina legislature was required to nullify the Ordinance of Secession and acknowledge emancipation, there were eight votes against these requirements and one of the most outspoken opponents was Alfred P. Aldrich from Barnwell.

South Carolina — including Barnwell County — lapsed into a period of attempted reconstruction which was marked with white repression of African Americans. In 1865 the South Carolina legislature passed three laws. The first recognized that slavery no longer existed, but placed stringent economic and social restrictions on former slaves. The second law prohibited black farmers from selling anything without "written permission of the employer or District judge." It prohibited the ownership of weapons, and it allowed any white person to arrest any "person of color" for any misdemeanor. The third law instituted a "sunrise to sunset" workday, placed restrictions on movement, and provided liberal justifications for employee dismissal. In addition, the law stipulated that blacks could only be farm laborers or hired servants, unless they purchased an expensive license from the district court. This in effect closed the door on black economic opportunity. Farm laborers were docked pay for leaving the plantation without permission, damaging the owner's property, showing laziness, and even for being sick. Visitors were not allowed without permission, laborers had to work six days a week, and conversations were often not permitted during work. Workers' children could be removed to other plantations and African Americans could still be beaten for their supposed transgressions. In many parts of the state a pass system similar to slavery was again instituted.

By 1880 the South Carolina legislature had even further limited black economic opportunities, made oral contracts binding, favored white planters in all disputes, and made the breach of contract a criminal offense equivalent to fraud. Another law allowed plantation owners to hold laborers on the plantation who owed them money.

The "Red Shirt Campaign" by Wade Hampton in 1876 was designed to further erode the few freedoms still held by African Americans. The campaign document directs, in part: "In speeches to negroes you must remember that argument has no effect upon them: they can only be influenced by their fears, superstition and cupidity. Do not attempt to flatter and persuade them. . . . Treat them so as to show them you are the superior race, and that their natural position is that of subordination to the white man." One of Hampton's chief lieutenants was Johnson Hagood, of Barnwell (Edgar 1998:407) and in 1884 Barnwell was the first country to refuse Black participation in its Democratic primary (Edgar 1998:414).

Gradually, again on the sweat of African Americans, the Barnwell economy recovered. By the late 1880s, for example, Barnwell's economy was based primarily on freed slaves, with an average of 65% of the laborers being African American. The predominant labor arrangements were "contract labor, day's labor paid for day's work, and labor employed for seven months for which wages are paid at the end of the term — men receiving $60 and women $45 to $50 for the term" (Anonymous 1884:n.p.). Day labor made about $6 to $9 a month. At that time there were 320 cotton gins in the county, along with 94 grist mills, 42 lumber mills, 10 turpentine stills, and a single machine shop. Cotton mills were also beginning to enter the area, with one being reported under construction at Tinker's Creek, 6 miles southwest of Williston.

Bamberg was defined as a separate county in 1897, and even earlier the region saw an increase in the importance of the railroads. Between 1890 and 1891 the Southbound Railroad Company completed its Columbia to Savannah line, crossing the South Carolina Railroad about a mile west of Graham's turn Out (later to become Denmark, South Carolina). By 1894 the Manchester and Augusta Railroad completed another rail segment crossing these earlier sections — further linking the region with the port of Charleston.

In 1900 the agricultural census revealed some agricultural stability in Bamberg County. There were 2,024 farms reporting, with an average size of about 86 acres. Nearly two-thirds of these farms (61%) were operated by blacks. On average 59% of the farm acreage was improved and 69% of the land in Bamberg County was in a farm (174,643 acres out of 252,800 acres). Nevertheless, Bamberg was a small county, carved out

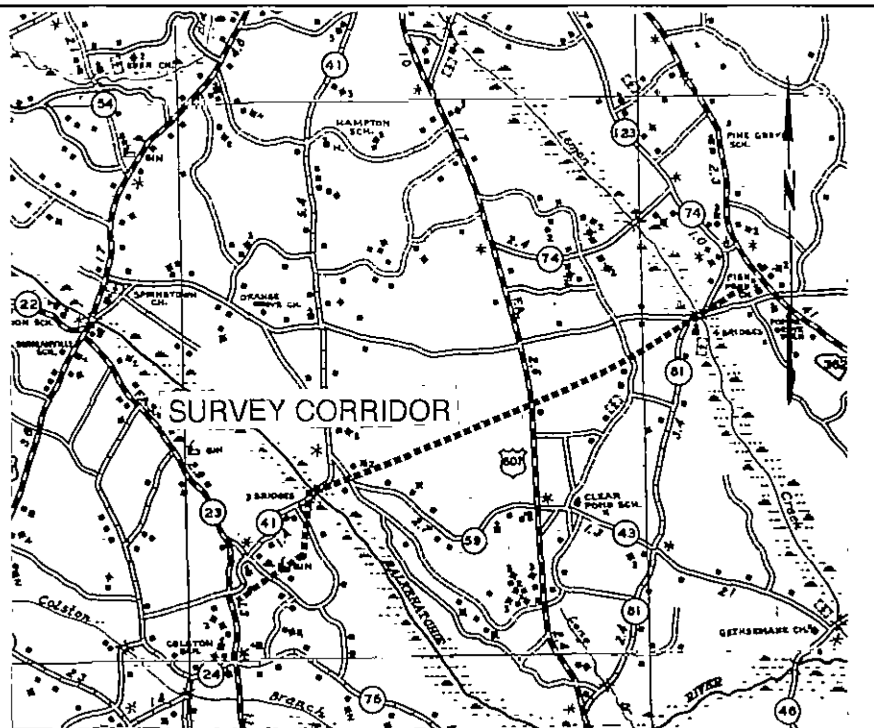

Figure 10. 1940 General Highway and Transportation Map for Bamburg County showing the project area.

of an area of bays and swamps. In terms of provision crops, it ranked 22 (out of 43) in corn production (with a yield of 383,080 bushels). Bamberg produced 50,098 bushels of peas, placing it eighth. The county's farms also produced 17,912 bushels of cotton, ranking the county 24th in terms of overall production. The yield, however, was an impressive 0.47 bale per acre (compared to yields of 0.40 bale in Georgetown, 0.46 bale in Florence, and 0.30 bale in Abbeville).

By 1920 the cotton harvest in Bamberg County amounted to 25,672 bales — representing an impressive improvement over the decade before. Yet this "improvement" came at a severe cost. Between over production, increased competition from abroad, and the spread of the boll weevil in the early1920s, the bottom dropped out of cotton. Edgar reports that:

> for the first six months of 1921 cotton prices were near or above 40¢ per pound; then they began to drop. By December cotton was 13½¢ a pound. The state commissioner of agriculture estimated that farmers spent $250 million planting a crop that would bring them only $140 million (Edgar 1998:481-482).

This began an agricultural depression that lasted the entire decade, up to the stock market crash of 1929 and the Great Depression. Edgar observes that state-wide farmland and buildings had lost more than 50% of their value and that a third of the state's farms were mortgaged. In Bamburg conditions were worse. The average farm value had fallen from $3,602 in 1920 to $2,047 in 1930, with nearly 38% of the farms being mortgaged. The average value of the mortgage, in 1930, was $1,641 — over half the value of the farm.

The agricultural problem was exacerbated by tenancy. In 1930 there were 1393 tenants in Bamberg County, operating 79,099 acres, for an average farm size of 56 acres. Over three-quarters of these tenants were African Americans. In contrast, there were 435 farm owners, tilling 52,562 acres, for an average farm size of nearly 121 acres. And nearly three-quarters of these owners (71.0%) were white.

Figure 10 shows the distribution of farmsteads and other structures (such as cotton gins and schools) in the project area about 1940. Even this recently it becomes clear that much of the survey corridor crosses areas of limited agricultural activity or potential.

METHODS

Field Methods

The initially proposed field techniques involved the placement of shovel tests at 100 to 200 foot intervals. These tests would be placed along the centerline of the corridor, with all fill being screened through ¼ inch mesh. One transect, running down the centerline, was proposed since the corridor is only 75 feet wide. In areas of standing water no tests would be excavated. In areas of good surface visibility (with exposure of 75% or more of the ground surface) a pedestrian survey would be used in conjunction with shovel testing. Although some points were missing, the centerline was staked at the time of our work, and following the corridor was relatively easy.

All soil would be screened through ¼ inch mesh, with each test numbered sequentially. Each test would measure about 1 foot square and would normally be taken to a depth of at least 1 foot. All cultural remains would be collected, except for shell, mortar, and brick, which would be quantitatively noted in the field and discarded. Notes would be maintained for profiles at any sites encountered.

Should sites (defined by the presence of two or more artifacts from either surface survey or shovel tests within a 25 feet area) be identified, further tests would be used to obtain data on site boundaries, artifact quantity and diversity, site integrity, and temporal affiliation. These tests would be placed at 25 to 50 feet intervals in a simple cruciform pattern until two consecutive negative shovel tests were encountered. The information required for completion of South Carolina Institute of Archaeology and Anthropology site forms would be collected and photographs would be taken, if warranted in the opinion of the field investigators.

We discovered that the corridor, 7.1 miles in length, consisted of about 4.42 miles of wooded parcels (Figures 11-13). In these areas conventional shovel testing was conducted, although we often encountered moist or wet soils, hampering screening. Where such soils were found we increased the testing interval to 200 feet until either water was encountered (and the survey was terminated) or until the soil conditions improved and we reverted to testing at 100 foot intervals. There was only about 0.96 mile where the surface visibility was adequate to allow a pedestrian survey. In most of these areas, however, the fields were fallow and provided unrewarding surface visibility. Nevertheless, where fields were present both shovel testing and a pedestrian survey were conducted.

Approximately 1.72 miles of the corridor were classified as wet — denoting either standing water or soils so waterlogged that shovel tests filled with water as they were being excavated. In these areas no shovel testing was conducted. These wet areas were, however, walked whenever the water was less than about 0.5 foot deep. As the water got deeper, typically only in the swamp areas, the pedestrian survey was terminated.

As a result of this work, a total of 230 shovel tests were excavated at 100 foot intervals and an additional 27 were excavated at 200 foot intervals during this survey. In addition, 10 shovel tests were excavated at 50 foot intervals, in areas of the Little Salkehatchie crossing where the geophysical study suggested the potential for buried archaeological soils.

A final deviation from the proposed methodology involves the depth of shovel testing. In a few areas of the Little Salkehatchie crossing shovel tests were taken to depths in excess of 1.0 foot (in several cases to approximately 3.1 feet).

Architectural Survey

Because this project will use single wood poles of a very modest height, the architectural survey was limited to structures or buildings either on, or immediately adjacent to, the proposed line. This, of course, was relatively easy to determine since the

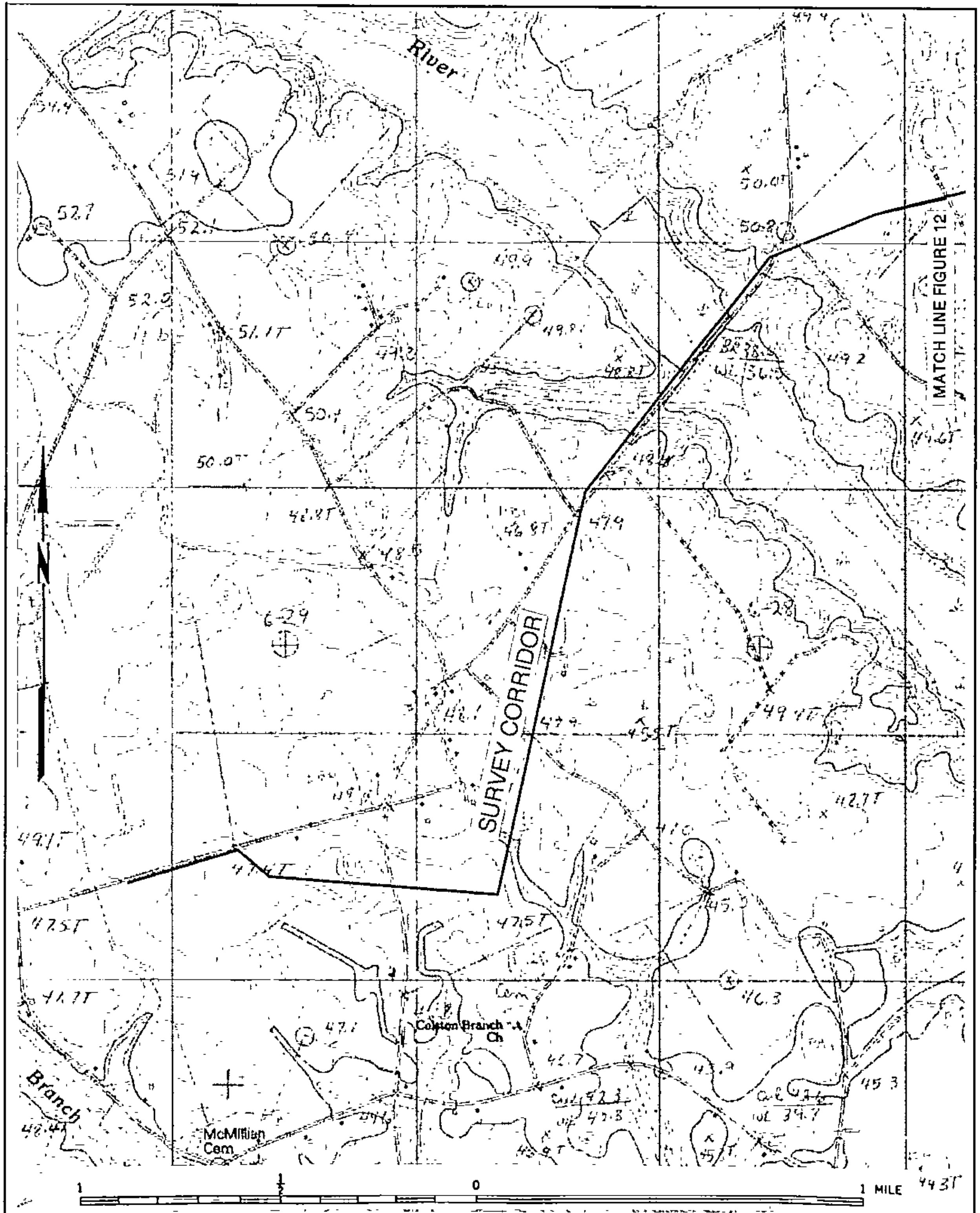

Figure 11. Portion of the Clear Pond 7.5' USGS topographic map showing the project corridor.

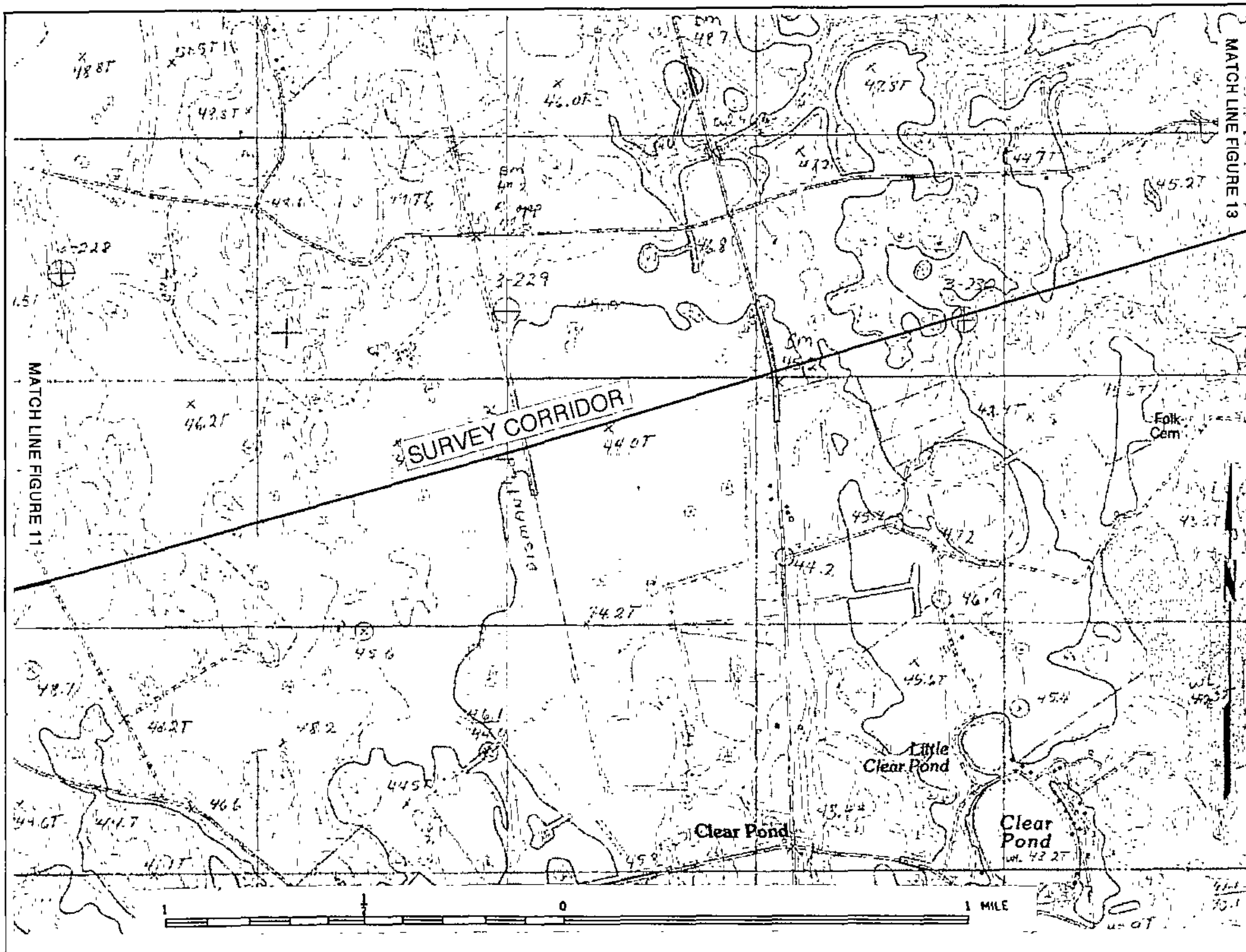

Figure 12. Portion of the Clear Pond 7.5' USGS topographic map showing the project corridor.

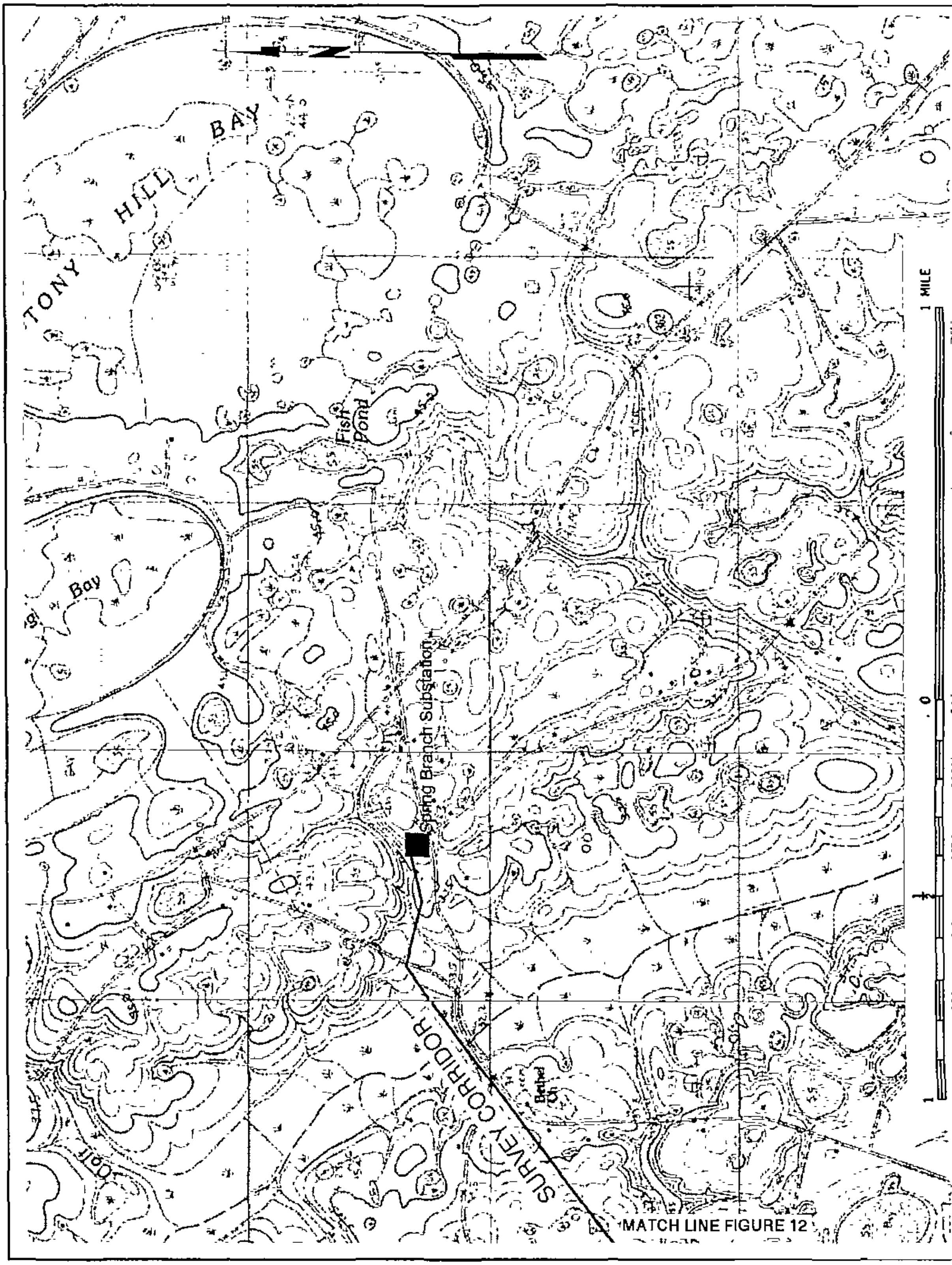

Figure 13. Portion of the Tony Hill Bay 7.5' USGS topographic map showing the project corridor.

corridor was staked in the field. For any structures present we anticipated completing a Statewide Survey Site Form with control numbers assigned by the S.C. Department of Archives and History.

Site Evaluation

Archaeological sites will be evaluated for further work based on the eligibility criteria for the National Register of Historic Places. Chicora Foundation only provides an opinion of National Register eligibility and the final determination is made by the lead federal agency in consultation with State Historic Preservation Officer at the South Carolina Department of Archives and History.

The criteria for eligibility to the National Register of Historic Places is described by 36CFR60.4, which states:

> the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> a. that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> b. that are associated with the lives of persons significant in our past; or
>
> c. that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> d. that have yielded, or may be likely to yield, information important in prehistory or history.

National Register Bulletin 36 (Townsend et al. 1993) provides an evaluative process that contains five steps for forming a clearly defined explicit rationale for either the site's eligibility or lack of eligibility. Briefly, these steps are:

- identification of the site's data sets or categories of archaeological information such as ceramics, lithics, subsistence remains, architectural remains, or sub-surface features;
- identification of the historic context applicable to the site, providing a framework for the evaluative process;
- identification of the important research questions the site might be able to address, given the data sets and the context;
- evaluation of the site's archaeological integrity to ensure that the data sets were sufficiently well preserved to address the research questions; and
- identification of important research questions among all of those which might be asked and answered at the site.

This approach, of course, has been developed for use documenting eligibility of sites being actually nominated to the National Register of Historic Places where the evaluative process must stand alone, with relatively little reference to other documentation and where typically only one site is being considered. As a result, some aspects of the evaluative process have been summarized, but we have tried to focus on each archaeological site's ability to address significant research topics within the context of its available data sets.

For architectural sites the evaluative process was somewhat different. Given the relatively limited architectural data available for most of the properties, we have focused on evaluating these sites using National Register Criterion C, focusing on the site's "distinctive characteristics." Key to this concept is the issue of integrity. This means that the property needs to have retained, essentially intact, its physical identity from the historic period.

Particular attention would be given to the integrity of design, workmanship, and materials. Design includes the organization of space, proportion, scale, technology, ornamentation, and materials. As *National Register Bulletin* 36 observes, "Recognizability of a property, or the ability of a property to convey its significance, depends largely upon the degree to which the design of the property is intact" (Townsend et al. 1993:18). Workmanship is evidence of the artisan's labor and skill and can apply to either the entire property or to specific features of the property. Finally, materials — the physical items used on and in the property — are "of paramount importance under Criterion C" (Townsend et al. 1993:19). Integrity here is reflected by maintenance of the original material and avoidance of replacement materials.

Laboratory Analysis

The cleaning and analysis of artifacts was conducted in Columbia at the Chicora Foundation laboratories. These materials have been catalogued and accessioned for curation at the South Carolina Institute of Archaeology and Anthropology, the closest regional repository. The site forms for the identified archaeological sites have been filed with the South Carolina Institute of Archaeology and Anthropology. Field notes and photographic materials have been prepared for curation using archival standards and will be transferred to that agency as soon as the project is complete.

Debitage categories included primary (defined as flakes with 90% or more cortex), secondary (defined as having 1% to 90% cortex), or tertiary (defined as having no cortex and sometimes called interior). These categories, widely used, are briefly explained by Yohe (1996:54-56).

Analysis of the historic collections followed professionally accepted standards with a level of intensity suitable to the quantity and quality of the remains. In general, the temporal, cultural, and typological classifications of the historic remains follow such authors as Cushion (1976), Godden (1964, 1985), Miller (1980, 1991), Noël Hume (1978), Norman-Wilcox (1965),. Peirce (1988), Price (1970), South (1977), and Walton (1976). Glass artifacts are identified using sources such as Jones (1986), Jones and Sullivan (1985), McKearin and McKearin (1972), McNally (1982), and Vose (1975). Sutton and Arkush (1996) provide an excellent overview of a broad range of other historic materials.

GEOARCHAEOLOGY OF THE LITTLE SALKEHATCHIE RIVER CROSSING

Keith C. Seramur, P.G.
Geonetics Corporation
Boone, North Carolina

Geoarchaeology Investigation

The purpose of the geoarchaeology assessment on the Little Salkehatchie River floodplain (Figure 14) was to evaluate the geomorphology and stratigraphy of the floodplain deposits and evaluate the potential for buried archaeological sites. This assessment included interpreting the sedimentology and stratigraphy of 10 cores collected across the floodplain of the river and a tributary stream (Figure 15). These interpretations are used to reconstruct the depositional history of the floodplain and to evaluate sedimentation rates and erosional processes. Sedimentation rates and erosional processes determine whether the archaeological stratigraphy and cultural context of buried archaeological sites could be preserved. Lastly, the investigations considers geologic factors that may have influenced occupation of the floodplain by Native Americans.

Methods

The geology and geomorphology of the subject site were described from a pedestrian reconnaissance of the corridor and from aerial photographs and topographic maps. Cores were collected with an AMS 24-inch soil probe and hammer. Up to 2.2 meters of core were collected in 1-inch plastic liners. Core recovery was limited below the water table due to the saturated nature of the sediment. The areas of "NR" or No Recovery shown on the core logs are where sediment was lost from the bottom of the core barrel while extracting the core from the floodplain (Figures 16 and 17).

The cores were labeled and chilled during storage. Once extracted from the liner the cores were split in half and photographed. The soil development in the cores were logged as well as the stratigraphy and the sedimentology of the floodplain.

Physiography and Regional Setting

The subject site is located in the middle coastal plain which consists of a series of marine terraces that decrease in elevation from northwest to southeast toward the lower coastal plain (Colquhoun 1965, 1969). The terrace deposits within the middle coastal plain are incised by fluvial systems that flow to the southeast in trellis to dendritic drainage patterns. Bedrock in the area is mapped as the Cooper Marl which consists of a sandy limestone (Heron 1962). This bedrock is capped with about 12 meters of alluvial terrace deposits overlying beds of marine sand, silt and clay.

The Little Salkehatchie River flows northwest to southeast down the regional gradient of the coastal plain (Figure 14). It has incised 10 to 12 meters into the surrounding terrace surface and the floodplain varies in width from 800 to 1200 feet. The terrace deposits adjacent to the stream valley consist sand and silty sand.

Geomorphology and Soils

The study area is a corridor approximately 100 feet in width that crosses the floodplain of the Little Salkehatchie River and an unnamed tributary stream (Figure 14). The corridor runs parallel to SC 41 at the river crossing and extends 800 feet across the floodplain of the tributary stream and 1,200 feet across the

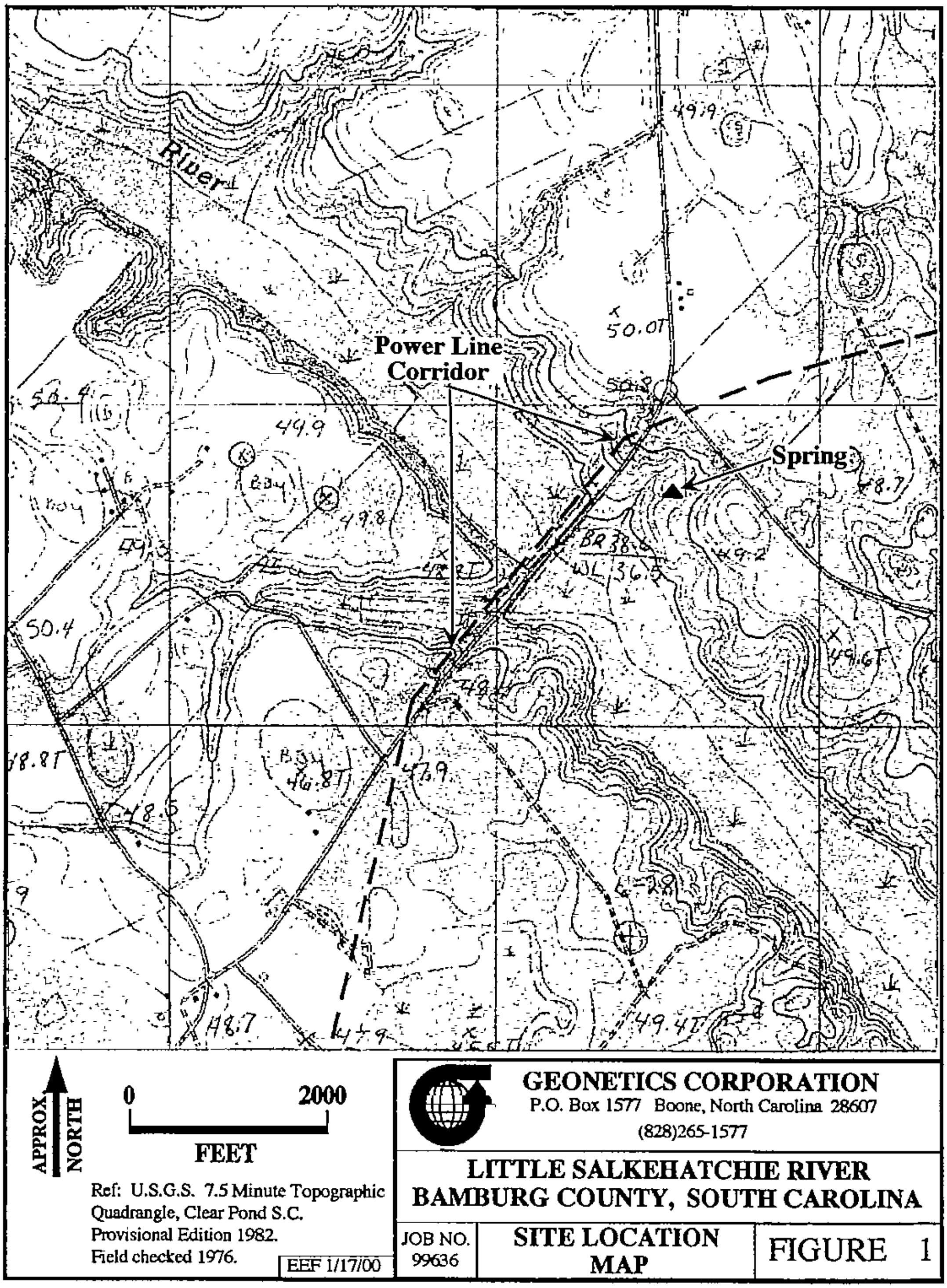

Figure 14. Project location (basemap is the USGS Clear Pond 7.5 topographic map).

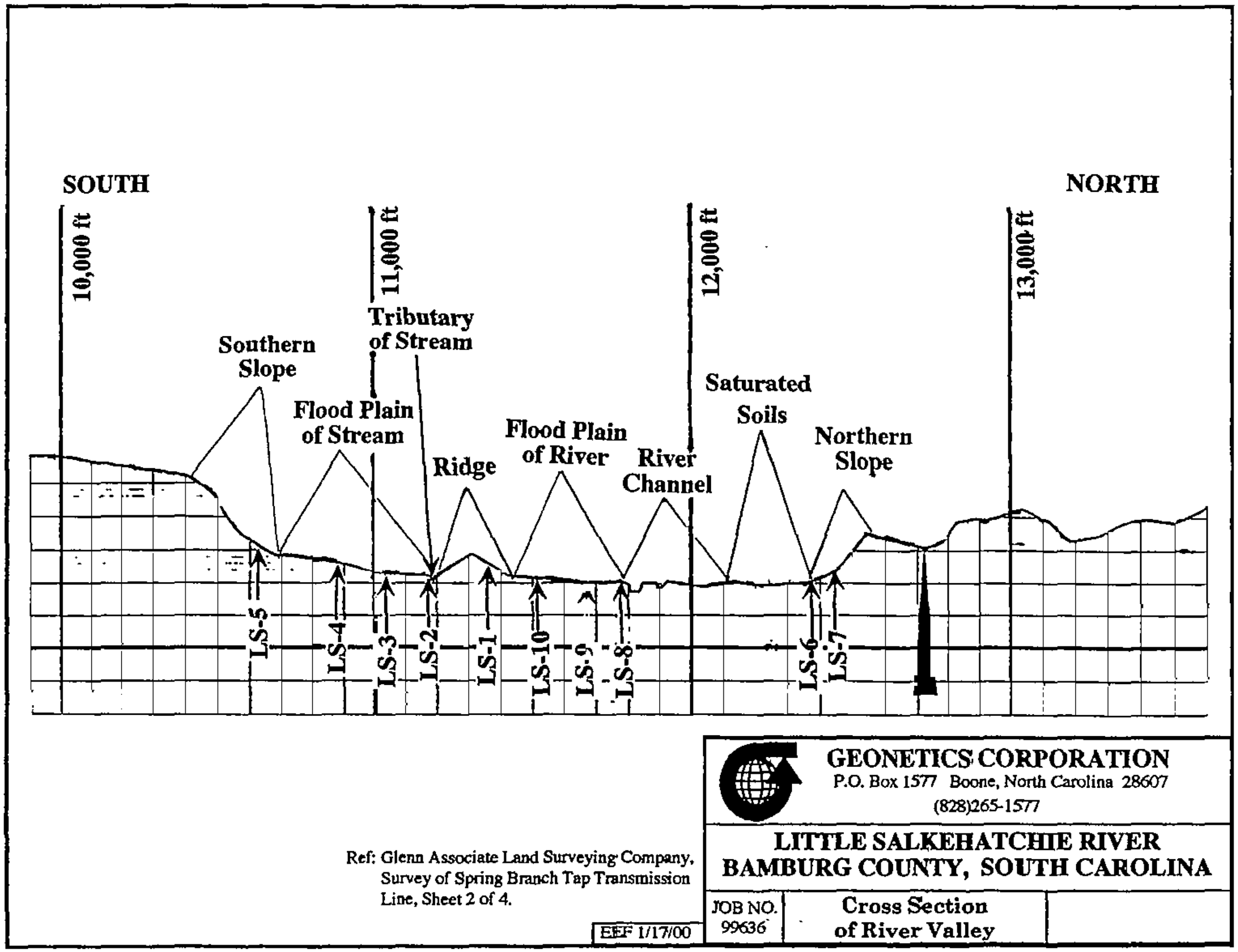

Figure 15. Cross section of the Little Salkehatchie River Valley on the project corridor.

floodplain of the Little Salkehatchie River. Floodplain deposits consist of up to 1.5 meters of sand and silty sand overlying remnant terraces deposits and weathered sandy limestone (Cooper Marl).

The Little Salkehatchie River flows along a low gradient. Upstream of the corridor, the stream channel splits into two channels and then flows back into one channel as it meanders down the stream valley. Adjacent to the river, the only elevated areas are where groups of trees and underbrush have trapped sediment within their roots resulting in a small rise or vegetative island on the floodplain. When the stream encounters one of these vegetative islands it can split the channel into two channels or it can deflect the stream changing its direction.

From north to south, the corridor slopes down the north side of the valley onto a portion of the floodplain that consists of a saturated soil and areas of pooled water indicating that the water table occurs at or just below the ground surface (12,530-12,100 ft, Figure 15). Core LS-7 was collected on a bench along the northern slope and core LS-6 was collected at the base of this slope. The corridor is occupied by the stream channel for about 300 feet where the bifurcated channel flows along the roadway and converges prior to flowing beneath the road (12,100-11,800 ft, Figure 15). Cores were not collected in this area. South of the bridge, the floodplain gently slopes up to a low ridge that separates the floodplains of the river and tributary stream (11,800-11,300 ft, Figure 15). Cores LS-8, LS-9 and LS-10 were collected from this part of the floodplain and Core LS-1 was collected on the ridge. The tributary stream channel flows along the southern edge of this low ridge (11,200 ft, Figure 15). Core LS-2 was collected from the levee adjacent to the tributary stream. South of the tributary stream the floodplain gently slopes up to the southern valley wall (11,200-10,600 ft., Figure 15). Cores LS-2, LS-3 and LS-4 were collected along this part of the floodplain and core LS-5 was collected at the base of the southern valley wall.

Soils along the corridor are mapped as Swamp, Lakeland Sand and Rustin Loamy Sand (USDA, 1995). The soils mapped as Swamp make up the majority of the low lying floodplain adjacent to the stream channels. Swamp is described as "very poorly drained soils on nearly level floodplains . . . typically they have black mucky loam . . . and gray fine sandy loam underlying layers" (USDA 1995). Lakeland sand is mapped on the north slope of the stream valley and along the ridge that separates the river from the tributary stream. Lakeland Sand is described as "well drained sandy soils on level to hilly coastal plain uplands . . . surface layers that are grayish brown sand or loamy sand . . . subsurface is strong brown to reddish yellow loamy sand" (USDA 1995). Rustin Loamy Sand is mapped on the southern slope of the stream valley and is described as a "well drained soil . . . surface layer is grayish brown loamy sand . . . subsoil is yellowish red to red sandy loam to sandy clay loam" (USDA 1995).

The USDA soil maps and descriptions provided a general description of soils through the corridor. These maps are too generalized to include the detailed pedology that was observed in cores collected through the corridor and recorded on the core logs (Figures 16 and 17). In general, the floodplain soils consist of an organic rich A-horizon overlying parent material which is alluvial sand and silty sand. There is little if any development of a subsoil such as an E-horizon or B-horizon because of high sedimentation rates.

The water table ranges in depth from 28 cm to 140 cm below the ground surface at the 10 core locations. The water table is at the ground surface in several areas of the floodplain where cores were not collected. In general, groundwater recharge occurs in the surrounding terrace uplands and discharges in seeps at the base of slope along the sides of the stream valley. Seeps were noted at the base of the northern and southern slopes along the corridor. Mr. Cecil E. Kirkland, land owner, reported a spring discharging from the northern slope of the stream valley about 250 meters west of the corridor (Figure 14). Mr. Kirkland stated that the spring had a continuous discharge even during periods of drought and had been used for generations as a source of drinking water. Based on Mr. Kirkland's information this spring is probably artesian in nature and is discharging from the limestone bedrock below the upland terrace deposits.

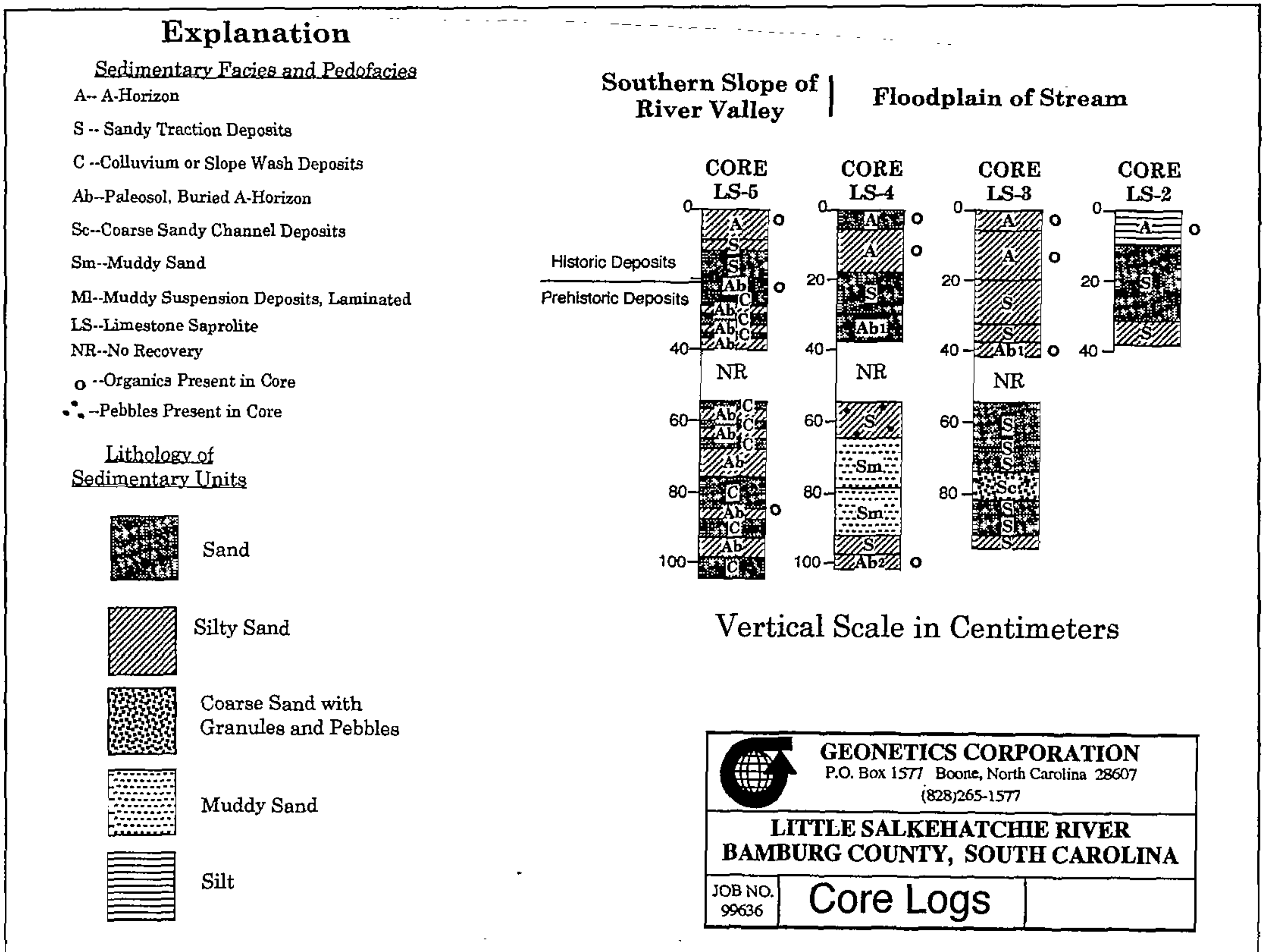

Figure 16. Core logs for LS-2 through LS-5.

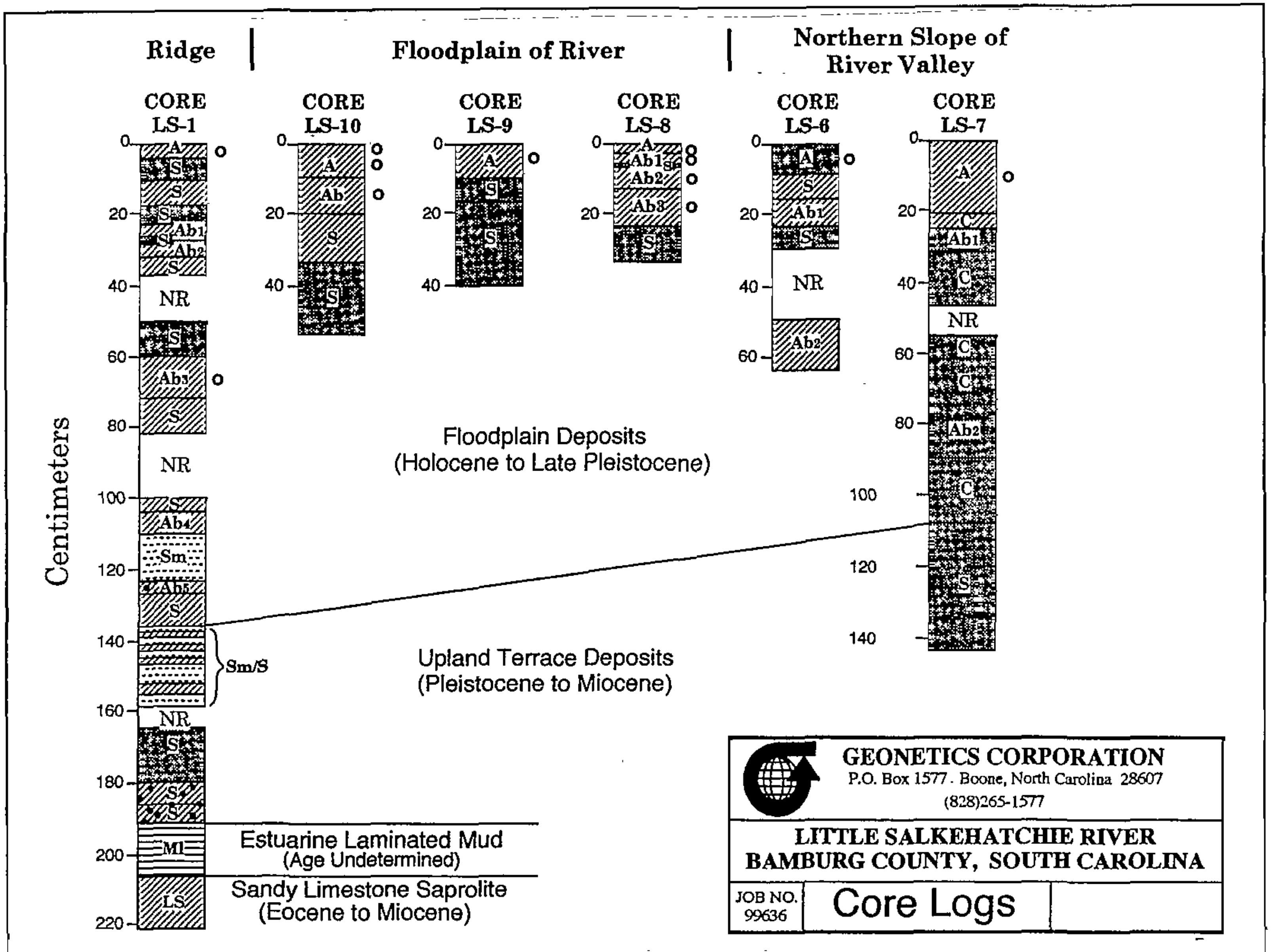

Figure 17. Core logs for LS-1 and LS-6 through LS-10.

Floodplain Deposits

Lithology, sedimentary facies and pedofacies are used to describe and interpret the floodplain deposits. Lithology describes the general lithology or physical and chemical characteristics of a sediment and is shown on the core logs by the different patterns (Figures 16 and 17). Sedimentary facies is a genetic interpretation of the depositional process that formed the deposit. Pedofacies is used here to describe deposits with distinguishing features resulting from post-deposition alteration by pedogenesis. Sedimentary facies and pedofacies are designated on the core logs by the symbol on each bed or sedimentary unit (Figures 16 and 17).

The lithology of each stratigraphic unit within the core is described and the pedofacies is interpreted from the lithofacies and soil taxonomy. The sedimentary facies are interpreted from lithology and the geomorphic setting. The sedimentary facies and lithology can then used to evaluate the potential for preservation of cultural context and stratigraphy of archaeological deposits within the floodplain.

There is little variation in the lithology of the sediment along the Little Salkehatchie River because of the geology of the drainage basin. The sediment within the floodplain is derived from the terrace deposits on the surrounding uplands. The terrace deposits consist of sand with minor amounts of clay and silt. Some granule and pebble sized clasts were also noted within these sandy terrace deposits in a road cut south of the stream valley. Most of the clay and silt is transported downstream in suspension and 95% or more of the floodplain sediment is sand.

A-horizon (A) - This is a pedofacies defined as a mineral horizon characterized by an accumulation of organic matter intimately mixed with the mineral fraction. This horizon is mixed by bioturbation.

Sandy Traction Deposits (S) - This sedimentary facies consists of fine to coarse sands and is interpreted to have been deposited by traction currents that transport sand along the floodplain prior to deposition. The fines (silt and clay) in this sediment are deposited with the sands during the flood events or introduced into the deposits by post-depositional pedogenesis. This sedimentary facies cannot be used as evidence for intact archaeological sites. Sites with intact features have been recorded in sandy traction deposits, but since the depositional process can transport sediment and cultural materials along the floodplain, the potential for preservation of context is uncertain.

Paleosol (Ab) - The paleosols are buried A-horizons and thus are considered a pedofacies. The paleosols are identified by their dark color or low (lightness) value resulting from organic staining of the sediment and an increase humus content. The paleosols developed on a stable land surface over a period of time when sedimentation rates were low. There is good preservation *potential* for archaeological sites within these paleosols.

Coarse Sandy Channel Deposits (Sc) - This sedimentary facies consists of medium to coarse sand commonly with abundant pebbles and is interpreted to have been transported as a bed load in a channel or flood chute. The currents that transport these coarse sediments commonly erode the land surface prior to depositing the coarse sand and pebbles. The preservation potential for archaeological sites within this facies is poor.

Laminated Mud (Ml) - This sedimentary facies was only found at a depth of about 200 cm in Core LS-1. Laminated mud is formed when clay, silt and fine sand is deposited by suspension settling. The lithology and stratigraphic location of this deposit suggests that it was probably a estuarine deposit of Pleistocene age or older.

Muddy Sands (Sm) - These deposits are interpreted as a pedofacies because they have been changed by post-depositional pedogenic processes. Clay and some silt is transported into these sediments from the overlying deposits through eluviation and illuviation. These deposits are originally sand or silty sand deposited by traction currents so the potential for preservation of cultural context is uncertain.

Colluvium (C) - This sedimentary facies consists of sediment washed down from the surrounding hill slopes during rain events. Since sediment in the upland terraces is similar to the floodplain deposits it is difficult to differentiate the alluvium from the colluvium. As with the sandy traction deposits the potential for preservation of context in this facies is uncertain.

Sandy Limestone Saprolite (LS) - Saprolite is the remnant soil from in-place chemical weathering of the bedrock. On this floodplain residual soil is a silty sand from the weathered sandy limestone. Archaeological materials are not expected to be associated with this saprolite.

The sedimentary processes that form floodplain deposits can determine if the context and stratigraphy of buried archaeological sites will be preserved (Reid et al. 1998 and Seramur et al., in press). Pedogenic features can be used to identify stable land surfaces and provide important information on post-depositional alteration. There is good potential for preservation of archaeological sites within the floodplain paleosols. Sand and coarser particles are deposited by traction currents in a high energy depositional environment where erosion and redeposition occur. Although intact archaeological sites can be found in beds of sand, the sedimentology of these deposits cannot be used as an indication of preservation potential. Fine sand, silt and clay sized particles are deposited by suspension settling in a lower energy depositional environment. Suspension deposits blanket the land surface with a continuous layer of sediment, preserving the deposits and archaeological sites below.

Core Descriptions

The core descriptions proceed from north to south along the corridor with each group of cores from similar sedimentary settings. A description of the pedology, stratigraphy and sedimentology is provided followed by an interpretation of the cores. Core Locations are shown on the Cross Section of the Stream Valley (Figure 15) and core descriptions are shown on the Core Logs (Figures 16 and 17).

Northern Slope of Stream Valley

Cores LS-7 was collected from a narrow bench about at mid-slope. LS-7 consists of a thick A horizon with many organics overlying silty sand and sand. Paleosols were noted at depths of 25 and 75 cm and were interbedded with relatively clean sands. Core LS-6 was collected at the base of the northern slope and there was limited sediment recovery due to the high water table. LS-6 consisted of an organic-rich A-horizon overlying sand and silty sand interbedded with 2 paleosols.

Core LS-7 consists primarily of colluvial deposits that accumulated on this bench over time. These deposits can form through the slow continuous accumulation of sediment by down slope creep and slope wash or can form rapidly during a significant rainstorm event or after a fire. During periods of low sedimentation rates, pedogenesis has time to develop thick A-horizons. These soils can be buried when a rainstorm event results in the deposition of a bed of sand on the land surface. The lower section of LS-7 (110-144 cm) appears to have penetrated the upland terrace deposits which are of Pleistocene age or older (Figure 3b). Core LS-6 is probably a composite of colluvial sediment from the adjacent slope and alluvial sediment from flood events occurring within the stream valley. Again, the paleosols were formed during periods of low sedimentation and buried by pulses of sediment accumulating at the base of this slope.

Floodplain of the Little Salkehatchie River

Cores were not collected from the floodplain north of the stream channel because standing water covered the limited area between the channel and the edge of the valley slope. Cores LS-8, LS-9, and LS-10 were collected from the floodplain south the stream channel. Core LS-8 was collected adjacent to the Little Salkehatchie River. LS-8 consisted of a stack of A-horizons overlying alluvial sand. LS-9 consisted of an A-horizon overlying gleyed sand and LS-10 contained two A-horizons over gleyed sands.

These cores contain alluvial silty sand and sand with soil development above 20 cm. These alluvial sands accumulate on this floodplain as thin layers during low magnitude flood events and as thicker beds during high magnitude flood events such as occur during hurricanes. Gleying of the sediment occurred below 10-20 cm in cores LS-9 and LS-10 and below 20-30 cm in LS-8. The floodplain at LS-8 was better drained because it was collected on the small levee adjacent to the stream channel and therefore the gleyed sediment occurred at a greater depth. Overall these cores show a consistent rate of sedimentation over time and continued pedogenesis at the surface resulting in stacked A-horizons. The gleying occurs below the water table where a reducing environment (low O_2 concentrations) exists.

Low Ridge Dividing the Floodplains

A road cut disturbed approximately the upper 0.5 meters of sediment on the top of the ridge so core LS-1 was collected on the north side of this ridge. This was the longest core collected and the good recovery is attributed to a low water table (140 cm below the ground surface) and competent sediment in the lower part of the core. The upper 110 cm of LS-1 consisted of an A-horizon overlying beds of sand and silty sand interbedded with at least four paleosols. The character of the deposits changes in the lower part of the core. Between 110 cm and 191 cm the sand and silty sand are interbedded with muddy sand. The term muddy indicates a mixture of silt and clay. Between 191 cm and 206 cm is a bed of laminated silt and below 206 cm is a bed of silty sand containing shell fragments.

From the ground surface to a depth of 136 cm, core LS-1 contains alluvial floodplain deposits. Paleosols indicating periods of low sedimentation interbedded with sand and silty sand beds deposited by high magnitude flood events. The paleosols and interbedded silty sand above 61 cm are lighter in color and contain less organics than in other cores (Figure 18). From 61 cm to 136 cm the core contains stratigraphy similar to cores LS-8, LS-9 and LS-10 where an organic rich A-horizon overlies sand and silty sand that becomes gleyed with depth (Figure 18).

A recognizable clay content occurs in beds between 136 cm and 191 cm in Core LS-1. These deposits are interpreted as remnant terrace deposits that form the core of this ridge. The laminated mud (clayey-silt) from 191 to 206 cm is possibly Pleistocene or older estuarine deposits. The deposits from 136 to 206 probably represent the estuarine and alluvial sediments formed when sea level retreated from this part of the coastal plain. The weathered micrite or muddy limestone in the base of the core would represent the top of the bedrock underlying the upland terraces in this area.

This low ridge underwent a period of erosion during incision of the stream valley followed by a period of sedimentation. The top of the erosion surface occurs in core LS-1 at a depth of 136 cm where the contact between floodplain deposits and the underlying terrace deposits occurs (Figures17 and 18). Sedimentation continued probably throughout the Holocene and resulted in the ridge aggrading and prograding downstream. Sediment accumulates on this ridge only during high magnitude flood events when flood waters backup into the tributary stream forming an eddy at the toe of the ridge. Deposits between 61 cm and 136 cm are interpreted to have a similar origin to floodplain deposition and pedogenesis that occurred in adjacent low lying areas with a fairly high water table and wet soils (e.g. Cores LS-1 LS-9, Figure 18). The paleosols formed above 61 cm developed under different conditions due to a lower water table and changes in the sedimentary environment. A dryer soil profile is indicated by the lighter color and fewer organics in the paleosols (Figure 18).

Floodplain of the Tributary stream

Core LS-2 was collected on a low levee along the channel of the tributary stream This core consists of an A-horizon developed in a sandy silt. LS-3 consisted of an organic rich A-horizon overlying sands and a paleosol at 38 cm. Below this were primarily bedded sands with a pebbly coarse sand from 76-80 cm. LS-4 consisted of an organic rich A-horizon overlying sand and a paleosol at 30 cm. The lower section of core LS-4 consisted of silty sand and muddy sand beds overlying a second paleosol at 98 cm.

Core LS-5 consisted of an A-horizon overlying a bed of clean sand that extended down to a depth of 21 cm. Below this are alternating beds of sand and paleosols that extend to the base of the core at a depth of 105 cm. The stratigraphy of this core, alternating paleosols and sand beds, is unique to the floodplain.

Core LS-2 shows the stratigraphy of the levee along the tributary stream. The bed of silt in the top of

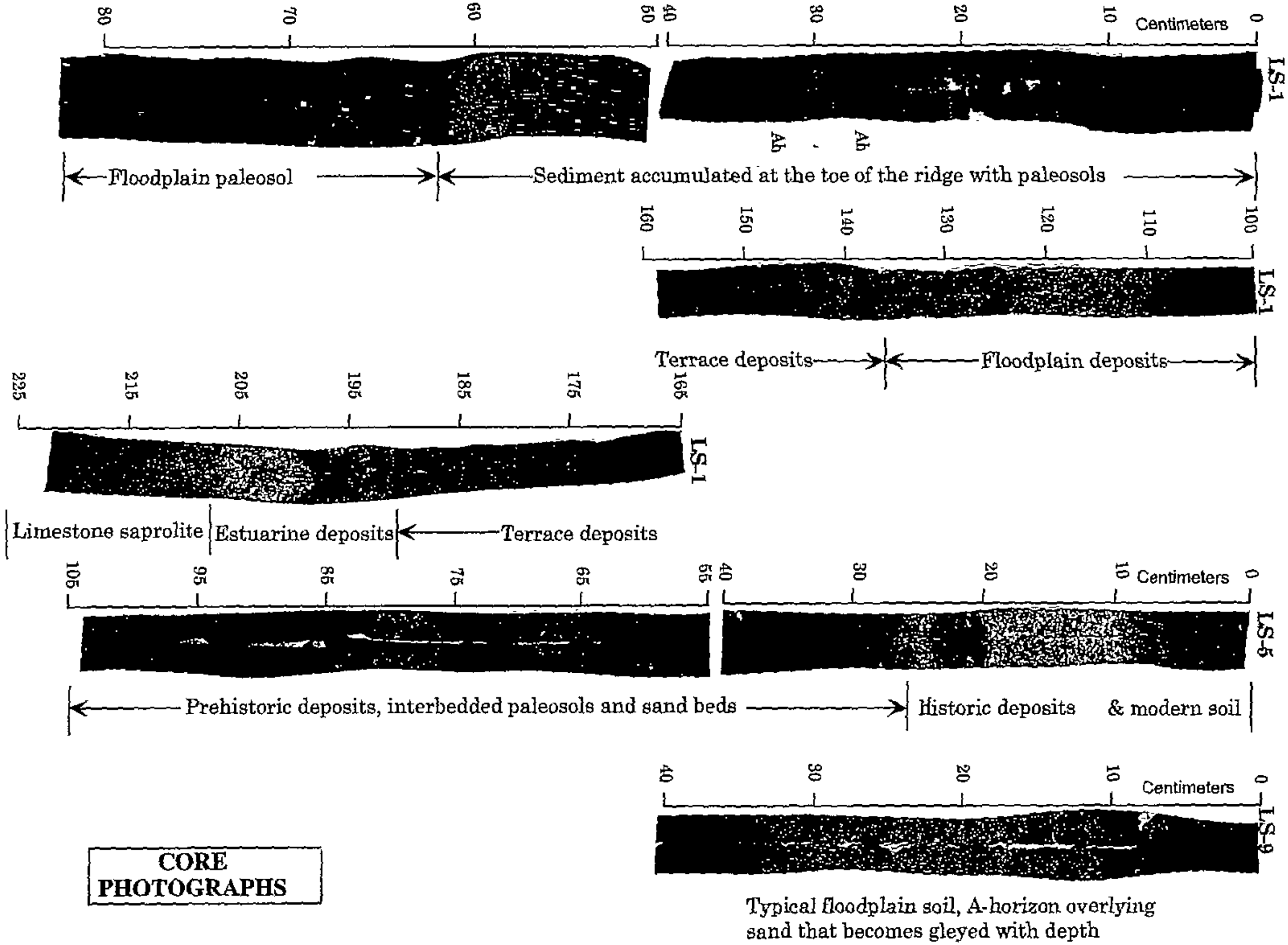

Figure 18. Photographs of selected cores.

core LS-2 is unusual since little silt occurs in the floodplain deposits. This silt is attributed to fines washing out of terrace sediments at the groundwater seeps along the base of the southern slope of the stream valley. These silts accumulate along the levee of the tributary stream during flood events.

Core LS-3 was collected at a slightly lower elevation than LS-4. In general these cores contain bedded alluvial deposits with one or two paleosols. The lower section of core LS-3 consists of coarse sand with a channel deposit between 76 and 80 cm. The channel deposit represents the former location of the tributary stream as it meandered across the floodplain. In contrast the lower deposits of LS-4 include silty sand and muddy sand. These indicate a lower energy depositional environment probably related to a higher elevation. The clay component in the beds between 68 and 93 cm is attributed illuviation, a pedogenic process by which clay and fine silt is washed down through the soil profile over time.

Core LS-5 is interpreted to contain primarily colluvial sediment from the southern slope of the stream valley. From a depth of 20 cm down to the base of the core are alternating paleosols and sand beds (Figure 4). This shows a pattern of soil development followed by a depositional event forming a sand bed. Above 20 cm is a thick bed of clean sand and the modern soil (Figure 4). The color and thickness of the sand bed (9 cm to 21 cm) is in contrast with the stratigraphy of the lower core and probably represents a change in land use. The present hypothesis is that the contact between historic and prehistoric sediment (about 1700 AD, 250 B.P.) occurs at 26 to 28 cm where there is a change in the stratigraphy of this core. This hypothesis could be confirmed with ^{14}C dating, but is beyond the scope of the current project.

During Prehistoric times, the edge of the floodplain was relatively stable with the exception of episodic depositional events from the adjacent slope of the valley wall. Between these depositional events, pedogenesis maintained an organic rich A-horizon on the ground surface. This changed with European settlement of the area and deforestation of the surrounding uplands. Deforestation led to increased erosion and deposition of a thick bed of clean sand above the prehistoric land surface.

Discussion and Conclusions

The cores collected along the power line corridor provide a stratigraphic record of historic deposits, pre-historic Holocene to Late Pleistocene floodplain deposits, and remnant Pleistocene to Miocene upland terrace and estuarine deposits. If buried archaeological sites were present along this corridor, they would occur within the Holocene to Late Pleistocene floodplain deposits. A contact between historic and prehistoric deposits was identified in core LS-5. This contact would indicate the upper boundary of intact prehistoric archaeological sites. The contact between the Holocene to Late Pleistocene floodplain deposits and Pleistocene to Miocene upland terrace deposits was identified in cores LS-1 and LS-7. Archaeological sites would not occur below this contact.

The geoarchaeology assessment was successful in describing the stratigraphy of the floodplain and interpreting the depositional history. As is fairly common in floodplains, correlation of stratigraphy between core locations was difficult because of the changes in the sedimentary environments across the floodplain. Stratigraphic correlation between sedimentary environments is assisted where an archaeological stratigraphy exists and ^{14}C dating has been completed.

There are only three geomorphic landforms on floodplains along the proposed power line corridor that might have been favorable for occupation by Native Americans. These include:

- the ridge separating the floodplain of the tributary stream from the river (core LS-1),
- the base of southern slope of the stream valley (core LS-5), and
- the bench in the northern slope of the river valley (core LS-7).

Cores LS-1 and LS-7 both contained intact stratigraphy and paleosols which are favorable for preservation of buried archaeological sites. The base of the southern slope of the stream valley (core LS-5) is another area where the land surface was elevated above the surrounding floodplain. Core LS-5 also contained a continuous stratigraphic record and paleosols.

The presence of these landforms and paleosols were communicated to Chicora Foundation. Their archaeological investigation was designed to address the paleosols and the potential for buried archaeological sites by using shovel testing and screening in these selected areas at an interval of 50 feet. Archaeological materials were not found within the deposits at these locations during their investigations.

Native American occupation of floodplain sites is influenced by resources associated with the floodplain. The seeps or springs along the base of the slope at the edge of these floodplains could provide a source of potable water. Archaeological sites on floodplains have been correlated to areas along streams where there is high biological productivity and food resources (Reid et al. 1998 and Seramur et al., in press). Within the piedmont province of the southeast, floodplain occupation has also been associated with agriculture because the sandy floodplain soils are easier to till than the surrounding saprolite soils in the piedmont.

Resource issues would not have influenced Native American occupation of this floodplain along the Little Salkehatchie River. There is a reported spring discharging from the southern slope adjacent to this floodplain that would have provided a more reliable source of potable water than the seeps discharging along the edge of the floodplain. The sandy upland soils in this part of the coastal plain are similar to the floodplain soils and therefore occupation of the floodplain would not be necessary to grow crops. Mr. Kirkland did report that there was good fishing along this stretch of the river, however there is easy access to the river from the adjacent upland terraces.

There were few landforms along the floodplain corridor suitable for occupation and few resources that would encourage occupation of an area susceptible to flooding and consisting primarily of wet soils. Based on the results of the geoarchaeology assessment and the archaeological testing, buried archaeological sites are not present along the power line corridor through this floodplain. No further subsurface investigation is recommended along this floodplain corridor.

RESULTS

Introduction

The intensive shovel testing and pedestrian survey identified two archaeological sites and one isolated find along the 7.1 mile corridor (Figure 19). One site, 38BM17 contains exclusively historic remains, while the other site, 38BM118 contains exclusively prehistoric materials. Neither site is recommended eligible for inclusion on the National Register of Historic Places. Three standing architectural structures were identified on, or adjacent to, the corridor. None are recommended eligible for inclusion on the National Register.

Identified Archaeological Sites

38BM117

Site 38BM117 is a light surface scatter of historic artifacts centered at station 75+00 on the survey corridor (Figure 19), in the middle of an agricultural field about 1,500 feet south of Orange Grove Road (S-41) and 750 feet north of Hadwin Road. The central UTM coordinates are E493527 N3671171 and the elevation is about 160 feet AMSL. The topography in this area is very level, with the nearest water source, the Little Salkehatchie River, situated about 4,000 feet to the northeast. The edge of the cultivated field is situated about 500 feet to the east and the nearby woods are primarily mixed hardwoods with a relatively dense understory of herbaceous vegetation. There are several small bays located within about 2,000 feet of the site.

The site was initially identified during the pedestrian survey of the field, which although fallow offered about 80% surface visibility. The site was found to represent a very sparse scatter of materials, contained within an area of 150 by 75 feet. The initial 100 foot interval shovel test fell in the middle of the site, but produced no artifacts. A series of 12 additional shovel tests were excavated in a cruciform pattern in the center of the concentration, but no subsurface remains were encountered in any of these tests (Figure 22).

The soil profiles all revealed a plowzone of about 0.9 foot of grayish brown (10YR5/2) loamy sand laying on a yellowish brown (10YR5/8) sand about 0.2 foot in depth. This, in turn, rests on a yellowish red (5YR5/6) sandy clay. The soils are consistent with Rustin sands, and evidence a distinct plowzone.

The recovered surface materials include a whiffletree hook, a fragment of unidentifiable iron, one fragment of whiteware, one fragment of clear container glass, one fragment of brown container glass, and one fragment of window glass. Also present, but not collected, were several small (under 1-inch in diameter) fragments of brick.

While the container glass and whiteware are domestic, the whiffletree hook is much more likely to be associated with a barn or utility building. The materials lack any diagnostic temporal attributes, but are in general consistent with sites dating from the late nineteenth and early twentieth centuries. Although the road systems in this area have changed dramatically, this site may be shown as a structure on the 1943 Olar 15' topographic map — the survey of which dates to 1918. It does not appear to be shown on the 1940 General Highway and Transportation Map, but on this map the road system is again shown differently and there clearly was some abbreviation of detail. It seems likely that this archaeological site is associated with a nearby standing architectural site, identified as U/09/0000/5170120 in this study, the remains of a cotton gin.

The historic materials recovered at 38BM117 may represent a very small historic site or may as easily represent secondary deposits (given the inaccuracies of the available maps). The data sets present at this site are very limited. Only six items were recovered from the surface, in spite of excellent surface visibility. No materials were recovered from any of the shovel tests,

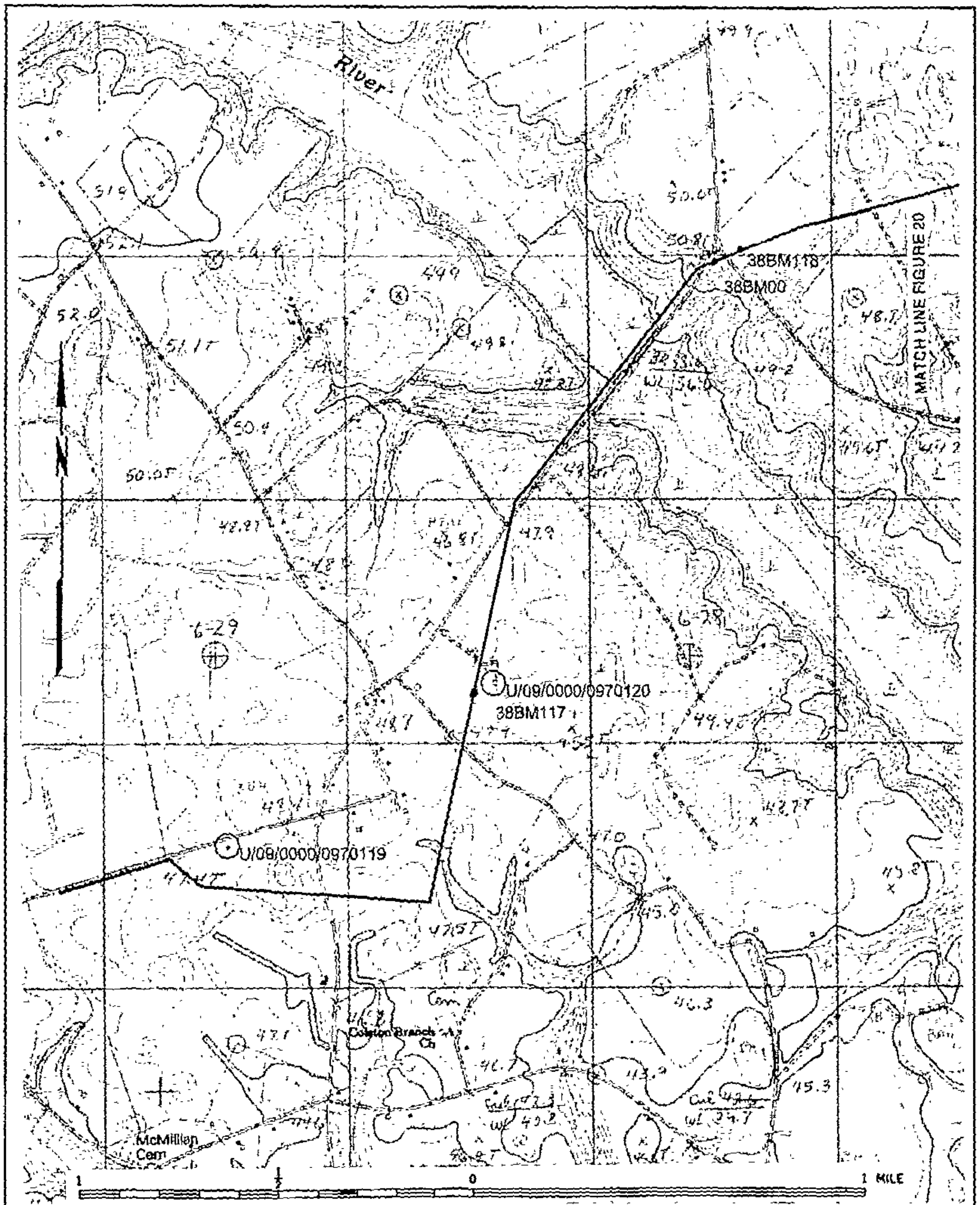

Figure 19. Portion of the Clear Pond 7.5' USGS topographic map showing sites identified in the corridor.

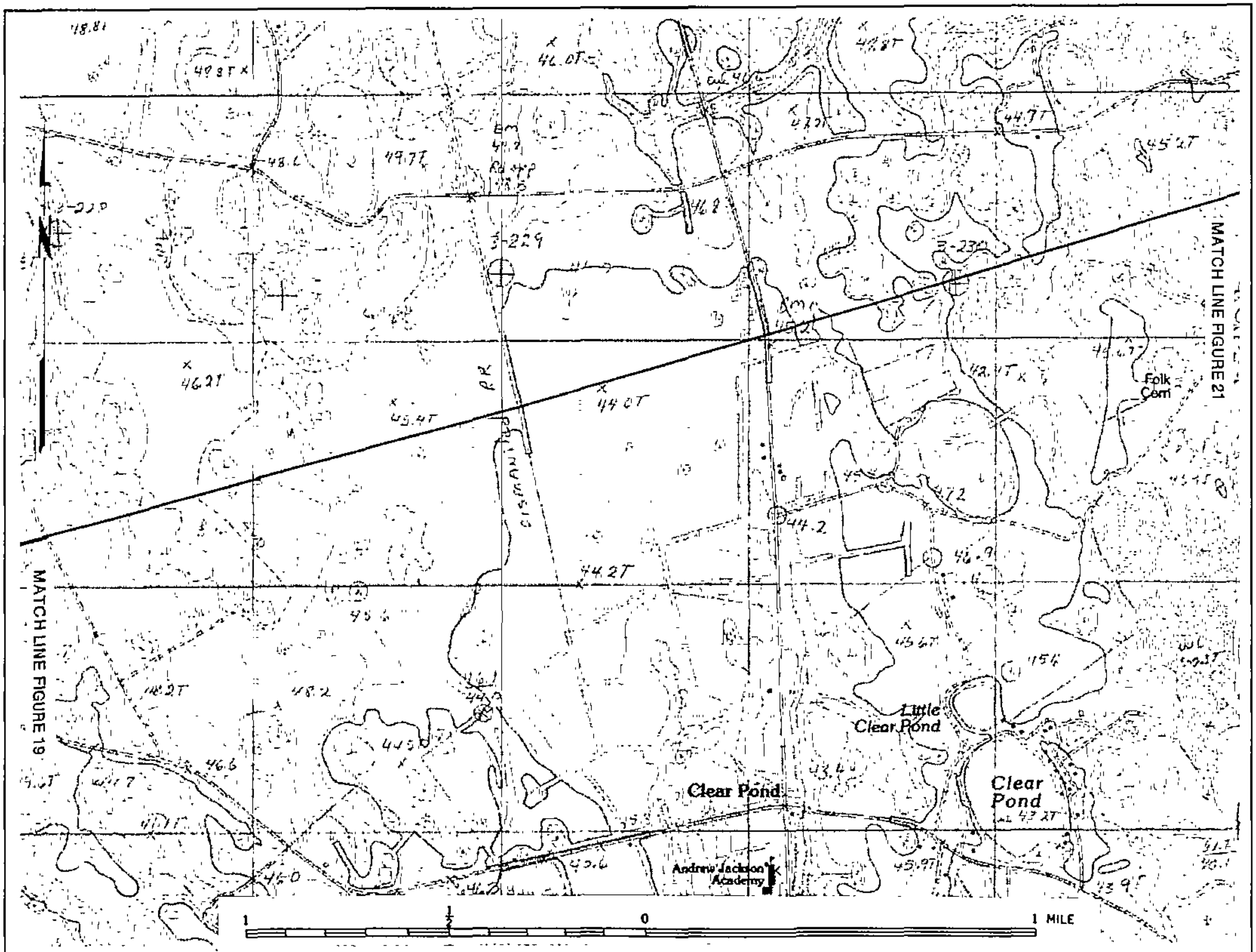

Figure 20. Portion of the Clear Pond 7.5' USGS topographic map showing sites identified in the corridor.

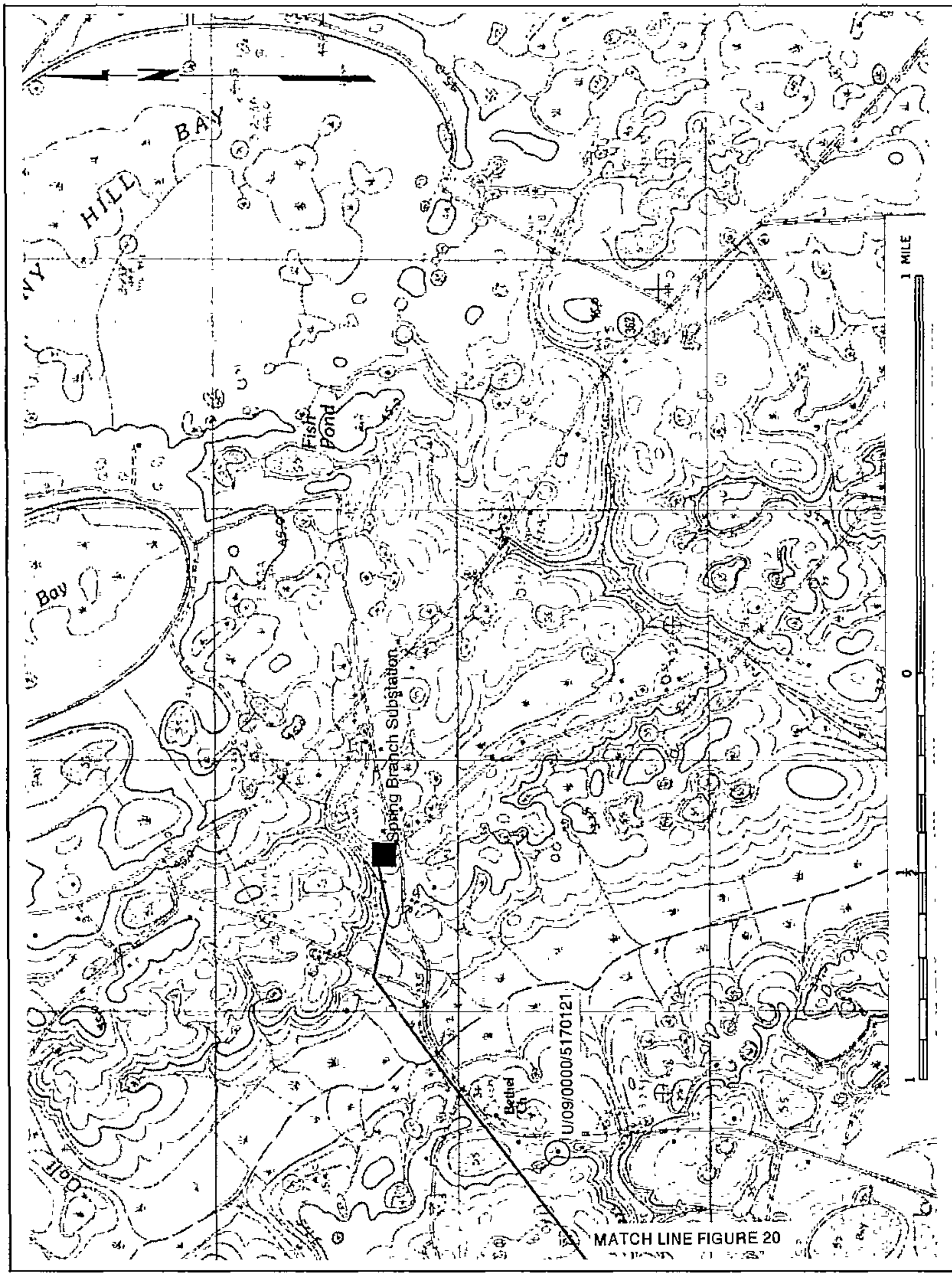

Figure 21. Portion of the Tony Hill Bay 7.5' USGS topographic map showing sites identified in the corridor.

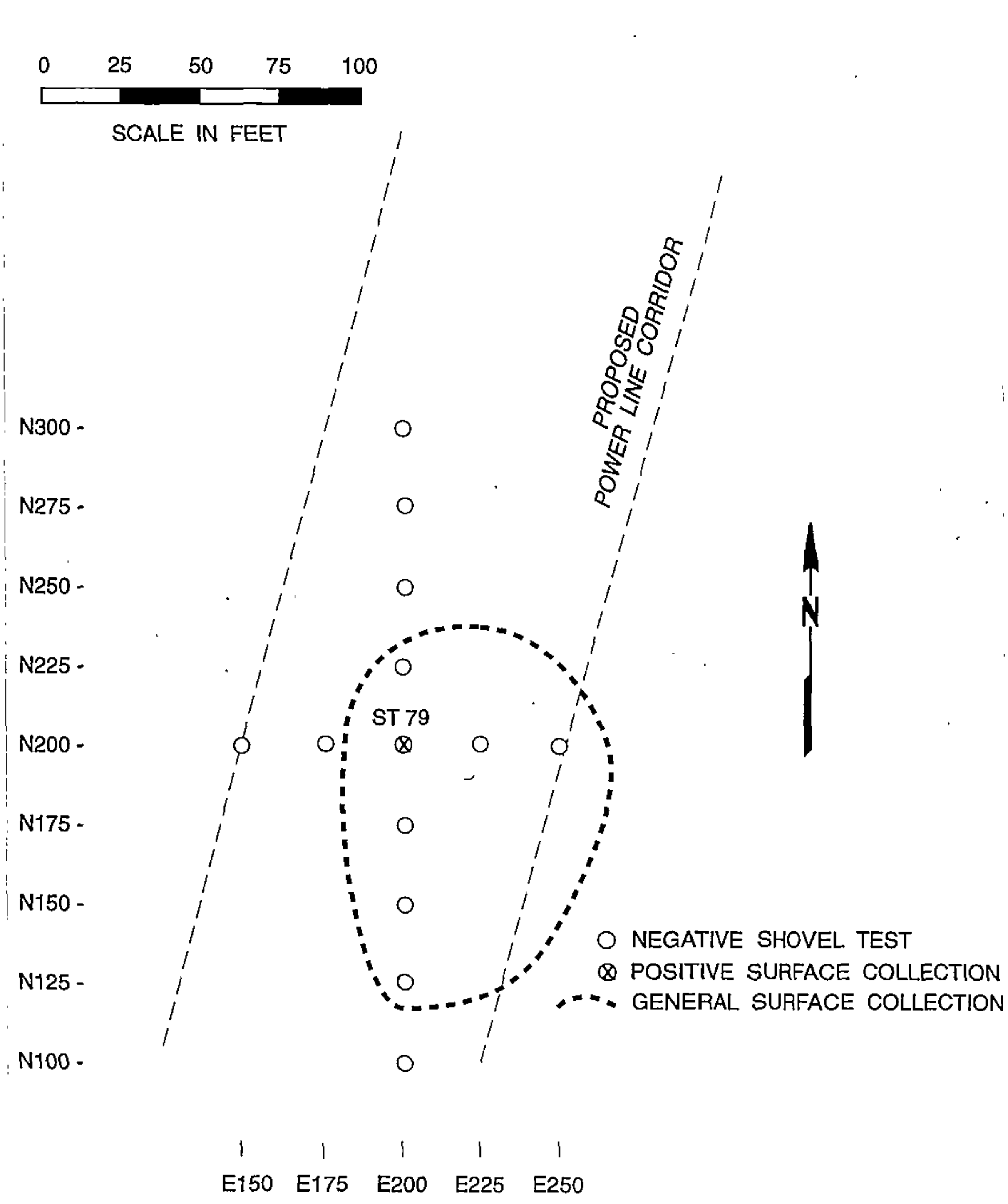

Figure 22. Site 38BM117.

and the only evidence of structural remains were not only limited, but also heavily fragmented by plowing. While there are a number of pertinent research questions that late nineteenth and early twentieth century historic sites can address, such research questions would require a much broader range of data sets then we have found at this site. For example, to explore site function, it would be necessary for the site to yield more artifacts, features, and material suitable for dating. It is also necessary for the site to exhibit, at the very least, some degree of intra-site patterning, perhaps concentrations of nails or other construction hardware reflected in surface collections or shovel testing density. None of these necessary data sets are present. It seems very unlikely that the site has the ability to provide the data sets necessary to address these questions. The site appears not only very superficial, yielding few artifacts on the surface, but also appears to have been intensively plowed, further reducing the potential to recover in situ remains.

As a result, we recommend the site as not eligible for inclusion on the National Register of Historic Places and recommend no further management activities.

38BM118

This site was first encountered in Shovel Test 173 at station 150+00 on the survey centerline. The site is situated about 390 feet east of the intersection of Orange Grove Road (S-41) and Clear Pond Road (S-59).The central UTM coordinates are E494240 N3672170 (Figure 21).

The topography in the site area is level and the elevation is about 150 feet AMSL. The nearest natural water source is the Little Salkehatchie River, about 2,300 feet to the southwest. The general site area is cultivated, although the materials identified were found in an area of heavy brush which is serving as a windbreak or hedgerow between fields. The surrounding area is characterized by dense forests of primarily hardwoods since the elevations tend to be low and the soils poorly drained.

The material initially found in ST 173 (also identified as N200E200 on the shovel testing grid) consisted of a single tertiary chert flake recovered from a depth of 1.2 foot. Additional tests were placed at 25 foot intervals, with a total of 15 additional shovel tests excavated, all to depths of at least 1.5 feet (Figure 23). Only one additional shovel test, at N200E225, was positive. That test yielded one chert secondary flake which may exhibit use along one edge, as well as one small (under 1-inch in diameter) undiagnostic sherd with sandy paste. Both of these items were recovered from a depth of 1.3 feet. The field on each side of the hedgerow was examined, but no additional materials were recovered.

Based on the two positive tests and absence of additional surface material, the dimensions of this site are estimated to be about 50 by 20 feet. The site appears to date (based on the single sherd) from the Woodland Period.

The shovel tests revealed about 1.2 feet of dark grayish brown (10YR4/2) loamy sand representing a plowzone, overlying a yellowish-brown (10YR5/6) sandy clay loam which represents the subsoil. The artifacts were found at the intersection of these two soils. We suspect that they are present at either the base of the plowzone or within the plowscars. The remains do not appear to be contained within the subsoil. These soils are consistent with the Norfolk sandy loams in this region.

This site appears to be a very small scatter of prehistoric remains, heavily impacted by cultivation. The data sets are very limited and only three artifacts were recovered, in spite of extensive testing and pedestrian survey. These remains are not adequate to address significant research questions associated with Woodland occupation in the Middle Coastal Plain, or resource use associated with Carolina bays. As a result, this site is recommended not eligible for inclusion on the National Register of Historic Places and no additional management activities are recommended pending the review of the State Historic Preservation Office.

38BM00

A single chert tertiary flake was recovered from Shovel Test 184 on the ridge overlooking the Little

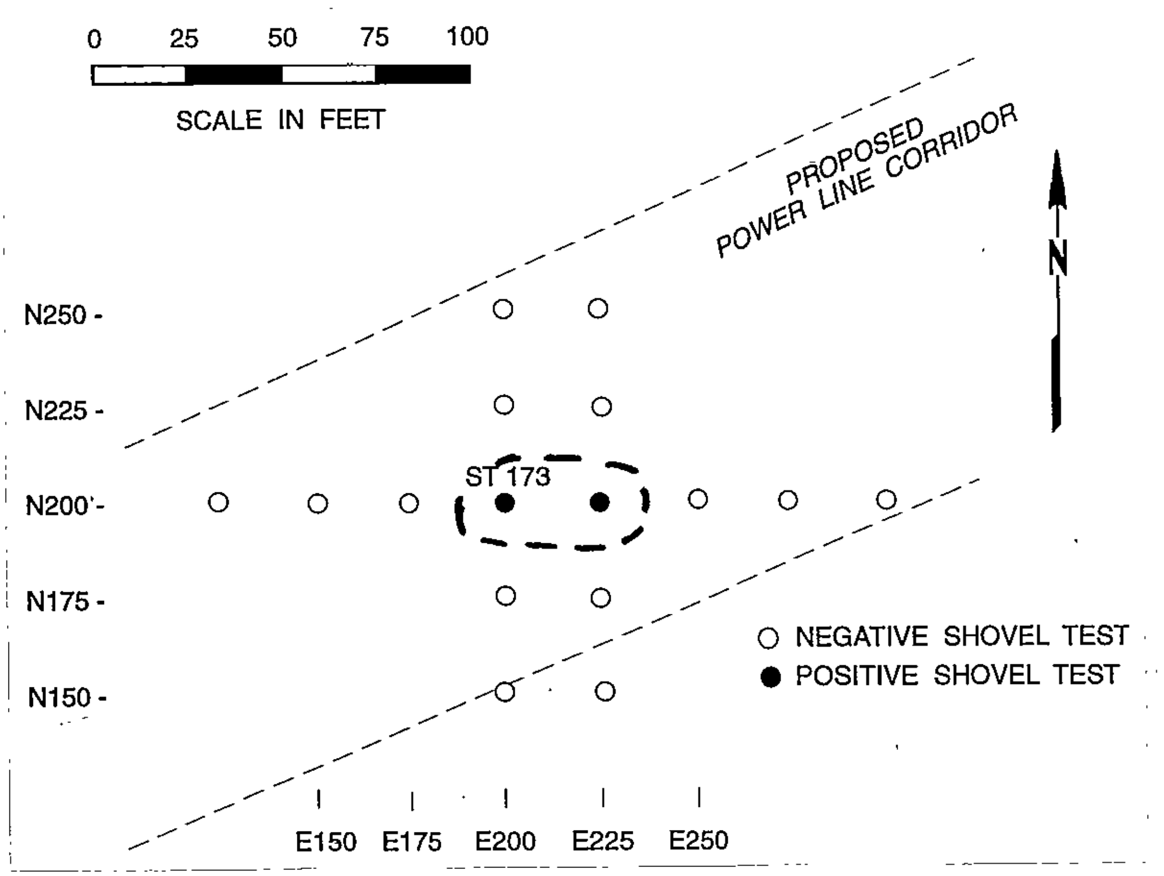

Figure 23. Site 38BM118.

Salkehatchie River. The central UTM coordinates are E494510 N3672925 and the isolated find is situated at station 377+00 in the survey corridor (Figure 21). The area has an elevation of about 160 feet AMSL and the topography rises to the northeast and slopes toward the southwest, toward the Little Salkehatchie River, about 1,000 feet downslope. The site was found on a small area of Lakeland sands, but in spite of this an additional eight shovel tests, excavated in a cruciform pattern around this positive test, failed to identify additional materials. The surrounding area is heavily overgrown in scrub hardwood and pine, with a fairly dense understory.

This site does not possess the data sets to make any substantive contribution to our understanding of Woodland occupation on swamp margins. As a result, we recommend it not eligible for inclusion on the National Register of Historic Places. No further management activity is recommended, pending the concurrence of the lead federal agency and the State Historic Preservation Officer.

Identified Historic Resources

No historic resources were identified within the proposed corridor. As a result, this proposed undertaking will not have any direct affect on any


Figure 24. View of north (front) and east facades of U/09/0000/0970119.

historic structures, sites, or objects in the project area. The study did, however, identify three historic resources in close proximity to the corridor. These include two houses and one probable cotton gin structure. These are briefly discussed below.

Structure U/09/0000/0970119

This structure is situated on Cedar Pond Road (S-59), 1,000 feet southwest of its junction with Orange Grove Road (S-23). The central UTM coordinates are E492520 N3670580.

This site consists of a one-story lateral gabled frame structure with a full-facade porch with a shed roof (Figure 24). The porch has chamfered posts and a balustrade with slat balusters. The structure has single windows with 6/6 sashes. It was built about 1924 by the father of John F. Kirkland and was the family's principal home through the mid-1960s. The structure is shown on the 1940 General Highway and Transportation Map for Bamberg County. About 1962 the structure was extensively altered with the addition of concrete stairs and probable porch decking replacement. A rear-ell was added, at which time an internal chimney was also included. The brick piers were reworked and a new front door with glazing was added.

There are five outbuildings associated with this structure, including a wood frame garage, wood frame shed, single story barn, abandoned privy, and chicken coop. These structures, while dating to about the same time as the main house, have been extensively reworked through their use, so none exhibit integrity.

The house is situated about 600 feet north of the proposed corridor and the view of the corridor is at partially obstructed by woods. Where the corridor may be visible it will likely be dramatically reduced in scale by the distance.

The alterations in this structure are extensive and we do not recommend it eligible for inclusion on the National Register of Historic Places. No additional management activities are recommended, pending review by the State Historic Preservation Office.

Structure U/09/0000/0970120

This structure is situated 500 feet southeast of Orange Grove Road (S-41) and its central UTM coordinates are E493600 N3671240.

This building, now abandoned, heavily overgrown, and in ruins, perhaps represents the shelter for a cotton gin. It is a rectangular one-story building with a lateral gable metal roof. It is of frame construction with largely open sides. It appears that the equipment has been removed or at least largely dismantled. There are no additional structures or support buildings, although this standing structure may be associated with nearby archaeological site 38BM117, situated about 500 feet to the southwest.

This structure may be shown on the 1940 General Highway and Transportation map for Bamberg County, although the road network makes a clear identification impossible. If we are correct that it represents a gin, then it is certainly one of the last used in the county, given the decline in cotton production through the 1930s and 1940s.

Figure 25. View of gin building in dense woods.

The structure is about 200 feet from the proposed corridor, although there are relatively dense intervening woods.

This structure is recommended not eligible for inclusion on the National Register. Absent the gin itself, it lacks integrity. Moreover, it is in poor condition and is not a good representative of cotton ginning.

Structure U/09/0000/0970121

This structure is located on Bethel Road (S-541) 800 feet south of its junction with Hadwin Road. The central UTM coordinates are E500435 N3674611.

This is a one story, lateral gable weatherboarded house with an ornamental front gable and full-facade shed roof porch supported by wood supports on brick piers (Figure 26). The single windows have 6/6 sashes and there is a single door in the front elevation. There is a single internal, corbeled chimney.

The house was built about 1915 and is shown on both the 1921 Lodge 15' topographic map and the 1940 General Highway and Transportation Map for Bamberg County. It was, however, altered about 1960 with the replacement of the front porch (now supported by a CMU foundation) and the addition of fill between the brick piers.

Also present in the side yard is a wood frame, end-to-front metal gable roof garage. No other support structures were visible during the survey.

The structure is situated on the opposite side of the road as the proposed corridor, about 100 feet to

Figure 26. South (front) and east facades of U/09/0000/0970121.

the southeast.

This structure has been too altered to be considered eligible for inclusion on the National Register of Historic Places. No further management activities are recommended, pending the review of the State Historic Preservation Office.

SUMMARY AND RECOMMENDATIONS

This study involved the examination of a 7.1 mile corridor for Central Electric Power Cooperative running from the east side of Lemon Branch southwesterly across generally low lands to the west side of the Little Salkehatchie River. The proposed corridor, 75 feet in width, is intended for the placement of single poles, typically about 50 feet in height. As a result, the proposed undertaking is anticipated to have little visual intrusion.

We determined that there were no previous archaeological sites identified in the study area and that there had been no previous architectural surveys in the vicinity. Nor were there any National Register listed sites in or adjacent to our study corridor.

Much of the corridor consists of wooded parcels and, in fact, only approximately 0.96 mile was sufficiently open and had sufficient surface visibility to allow a pedestrian survey (conducted in conjunction with the shovel test investigation). Much of the corridor also consists of poorly drained soils and slightly over 1.7 miles of the corridor consisted of tracts with standing water, water logged soils, or swamp. About 4.42 miles of the corridor were wooded, but sufficiently dry to allow shovel testing, which was conducted at 100 foot intervals on better drained soils and at 200 foot intervals on the lower, wetter soils.

In addition to the shovel testing conducted on the survey corridor, the State Historic Preservation Office required a geoarchaeological investigation in the floodplain of the Little Salkehatchie River. This work consisted of a survey of the floodplain geomorphology and the coring of selected landforms to describe the sedimentology and stratigraphy of the landforms. This work, which included the investigation of 10 cores along the centerline of the proposed corridor, encountered stratified deposits at three locations. At LS-1 buried soils were found between 0.74 and 0.85, 0.91 and 1.04, and 1.95 and 2.20 feet. At LS-5 buried soils were found between 0.65 and 0.78 and 0.98 and 1.20 feet. And at LS-7 buried soils were found between 0.81 and 1.04 and 2.40 and 2.90 feet.

In order to evaluate the potential for buried archaeological sites within these stratified deposits, the geologist recommended that shovel tests in the vicinity of these three cores extend through these deposits. In the floodplain areas of concern, shovel tests were conducted at 50 foot intervals (rather than either 100 or 200 foot intervals) and were excavated to the maximum depth possible with a shovel, typically about 2.5 feet. To reach the lower depths, shovel tests were supplemented with the use of posthole digger. All of the recovered soils were screened as normal for shovel tests, although much of the soil was moist to wet and had to be forced through screens. No cultural remains were found in the floodplain.

Of the three recovered occurrences of cultural remains found elsewhere in the corridor, one is a single component historic site (38BM117), one is a single component prehistoric site (38BM118), and one is an isolated find of a single prehistoric flake (38BM00).

These sites were evaluated for their potential to address significant research questions. All were found to consist of very small data sets and to have suffered extensive damage from plowing. As a result, we have recommended none of the sites as eligible for inclusion on the National Register of Historic Places. As such, no additional management activities are recommended at these sites, pending the review and concurrence by the lead federal agency and the South Carolina State Historic Preservation Office.

An examination of the corridor and areas immediately adjacent to the corridor identified three standing structures. Two, U/09/0000/0970119 and U/09/0000/5170121, are houses dating from the first quarter of the twentieth century which have been extensively altered. As a result, we feel that their integrity has been compromised and that neither is eligible for inclusion on the National Register of Historic Places. The third standing structure, U/09/0000/0970220, is a building used during the mid-twentieth century as a cotton gin. The structure is in abandoned, in poor condition, with some portions in collapse. There is no equipment remaining in the structure. As a result, we do not believe that this structure is eligible for inclusion on the National Register. As a result, we recommend no additional management activities for these three structures, pending the review of the State Historic Preservation Office.

Based on this study we do not believe that the proposed transmission line is likely to have an effect on any cultural resources that are eligible for inclusion on the National Register of Historic Places. Nor is it likely that any cultural resources exist in the Little Salkehatchie corridor. As noted by the consulting geologist, there are other locations which offer equal or better access to lowland resources, yet provide more favorable conditions for habitation. As a result, we recommend no additional investigations in the floodplains.

It is possible that archaeological remains may be encountered in the corridor during maintenance activities. As always, the utility's contractors should be advised to report any discoveries of concentrations of artifacts (such as bottles, ceramics, or projectile points) or brick rubble to the project engineer, who should in turn report the material to the State Historic Preservation Office, or Chicora Foundation (the process of dealing with late discoveries is discussed in 36CFR800.13(b)(3)). No further land altering activities should take place in the vicinity of these discoveries until they have been examined by an archaeologist and, if necessary, have been processed according to 36CFR800.13(b)(3).

SOURCES CITED

Anderson, David G.
1979 *Excavations at Four Fall Line Sites: The Southeastern Beltway Project.* Commonwealth Associates, Inc., Jacksonville, Michigan. Submitted to the South Carolina Department of Highways and Public Transportation, Columbia.

Anderson, David G., Charles E. Cantley, and A. Lee Novick
1982 *The Mattassee Lake Sites: Archaeological Investigations Along the Lower Santee River in the Coastal Plain of South Carolina.* Commonwealth Associates, Jackson, Michigan.

Anonymous
1884 *South Carolina in 1884: A View of the Industrial Life of the State*. The News and Courier, Charleston, South Carolina.

Baldwin, John L.
1973 *Climates of the United States.* U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Washington, D.C.

Barry, John M.
1980 *Natural Vegetation of South Carolina*. University of South Carolina, Columbia.

Blanton, Dennis B., Christopher T. Espenshade, and Paul E. Brockington, Jr.
1986 *An Archaeological Study of 38SU83: A Yadkin Phase Site in the Upper Coastal Plain of South Carolina*. Garrow and Associates, Inc., Atlanta.

Cable, John
1991 *Archaeological Test Excavations on the Northeastern Perimeter of the Buck Hall Site (38CH644), Francis Marion National Forest, South Carolina*. New South Associates, Irmo, South Carolina.

Caldwell, Joseph R.
1958 *Trend and Tradition in the Prehistory of the Eastern United States.* Memoirs of the American Anthropological Association 88.

Coe, Joffre
1964 *The Formative Cultures of the Carolina Piedmont*. Transactions of the American Philosophical Society 54(5).

Colquhoun, D.J.
1965 *Terrace Sediment Complexes in Central South Carolina*. Atlantic Coastal Plain Geological Association Field Conference, University of South Carolina, Columbia.

1969 *Geomorphology of the Lower Coastal Plain of South Carolina*. MS-15, State Development Board, Division of Geology, Columbia.

Cooke, C. Wythe
1936 *Geology of the Coastal Plain of South Carolina*. Bulletin 867. U.S. Geological Survey, Washington, D.C.

Crow, Eron, E.C. Moore, and O.L. Dodd
1966 *Soil Survey of Bamberg County, South Carolina*. U.S. Department of Agriculture, Soil Conservation

Service, Washington, D.C.

Cushion, John P.
1976 *Pottery and Porcelain Tablewares*. Studio Vista, London.

DePratter, Chester
1979 Ceramics. In *The Anthropology of St. Catherines Island 2. The Refuge-Deptford Mortuary Complex*. Anthropological Papers of the American Museum of Natural History 56(1): 109-132.

Edgar, Walter
1998 *South Carolina: A History*. University of South Carolina Press, Columbia.

Ferguson, Leland G.
1971 *South Appalachian Mississippian*. Ph.D. dissertation, University of North Carolina, Chapel Hill. University Microfilms, Ann Arbor, Michigan.

Godden, Geoffrey A.
1964 *Encyclopaedia of British Pottery and Porcelain Marks*. Schiffer Publishing, Exton, Pennsylvania.

1985 *English China*. Barrie and Jenkins, London.

Goodyear, Albert C., John H. House, and Neal W. Ackerly
1979 *Laurens-Anderson: An Archaeological Study of the Inter-Riverine Piedmont*. Anthropological Studies 4, Occasional Papers of the Institute of Archaeology and Anthropology, University of South Carolina, Columbia.

Haag, William G.
1975 The Paleoecology of the South Atlantic Coast. *Geoscience and Man* 12:77-81.

Hanson, Glen T., Jr.
1982 The Analysis of Late Archaic-Early Woodland Adaptive Change Along the Middle Savannah River: A Proposed Study. *South Carolina Institute of Archaeology and Anthropology Notebook* 14:1-38.

Heron, S.D., Jr.
1962 *Limestone Resources of the Coastal Plain of South Carolina*. Bulletin No. 28, State Development Board, Division of Geology, Columbia.

Jones, Olive R.
1986 *Cylindrical English Wine and Beer Bottles, 1735-1850*. National Historic Parks and Sites Branch, Quebec.

Jones, Olive R. and Catherine Sullivan
1985 *The Parks Canada Glass Glossary for the Description of Containers, Tableware, Flat Glass, and Closures*. National Historic Parks and Sites Branch, Parks Canada, Quebec.

Lefler, Hugh T., editor
1967 *Lawson's A New Voyage to Carolina*. University of North Carolina Press, Chapel Hill.

Lower Savannah Regional Planning Council
1975 *A Survey of Historical Sites in the Lower Savannah Region*. N.p., n.p.

Mathew, William M, editor
1992 *Agriculture, Geology, and Society in Antebellum South Carolina: The Private Diary of Edmund Ruffin, 1843*. University of Georgia Press, Athens.

Mathews, Thomas D., Frank W. Stapor, Jr., Charles R. Richter, John V. Miglarese, Michael D. McKenzie, and Lee R. Barclay
1980 *Ecological Characterization of the Sea Island Coastal Region of South*

Carolina and Georgia, vol. 1. Office of Biological Services, Fish and Wildlife Service, Washington, D.C.

McKearin, George L. and Helen McKearin
1972 *American Glass*. Crown Publishers, New York.

McNally, Paul
1982 Table Glass in Canada, 1700-1850. *Parks Canada History and Archaeology* 60.

Michie, James
1977 *The Late Pleistocene Human Occupation of South Carolina*. Unpublished Honor's Thesis, Department of Anthropology, University of South Carolina, Columbia.

Miller, George
1980 Classification and Economic Scaling of 19th Century Ceramics. *Historical Archaeology* 14:1-40.

1991 A Revised Set of CC Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880. *Historical Archaeology* 25(1):1-25.

Mills, Robert
1972[1826] *Statistics of South Carolina*. Hurlbut and Lloyd, Charleston, South Carolina. 1972 facsimile ed. The Reprint Company, Spartanburg, South Carolina.

Noël Hume, Ivor
1978 *A Guide to Artifacts of Colonial America*. Alfred A. Knopf, New York.

Norman-Wilcox, Gregor
1965 Pottery and Porcelain. In *The Concise Encyclopedia of American Antiques*, edited by Helen Comstock, p.132-161. Hawthorn, New York.

Oliver, Billy L.
1981 *The Piedmont Tradition: Refinement of the Savannah River Stemmed Point Type*. Unpublished Master's thesis, Department of Anthropology, University of North Carolina, Chapel Hill.

Phelps, David A.
1983 Archaeology of the North Carolina Coast and Coastal Plain: Problems and Hypotheses. In *The Prehistory of North Carolina: An Archaeological Symposium*, edited by Mark A. Mathis and Jeffrey J. Crow, pp. 1-52. North Carolina Division of Archives and History, Department of Cultural Resources, Raleigh.

Peirce, Donald C.
1988 *English Ceramics: The Frances and Emory Cocke Collection*. High Museum of Art, Atlanta.

Plummer, Gayther L.
1975 18th Century Forests in Georgia. *Georgia Academy of Science Bulletin* 33(1):1-19.

Price, Cynthia
1979 *19th Century Ceramics in the Eastern Ozark Boarder Region*. Monograph Series 1. Center of Archaeological Research, Southwest Missouri University, Springfield.

Reid, W.H., Seramur, K.C., and Lautzenheiser, L.
1998 *Archaeological Testing, The Prehistoric Sites (Phase II)-Proposed Randleman Reservoir, Randolph and Guilford Counties, NC*, vol. 2. Coastal Carolina Research, Tarboro, North Carolina.

Richards, Horace G.
1950 *Geology of the Coastal Plain of North*

Carolina. Transactions of the American Philosophical Society 40(1).

Ryan, Thomas M.
1972 *Archaeological Survey of the Columbia Zoological Park, Richland and Lexington Counties, South Carolina*. Research Manuscript Series 37. South Carolina Institute of Archaeology and Anthropology, University of South Carolina, Columbia.

Sandifer, Paul A., John V. Miglarese, Dale R. Calder, John J. Manzi, and Lee A. Barclay
1980 *Ecological Characterization of the Sea Island Coastal Region of South Carolina and Georgia*, vol. 3. Office of Biological Services, Fish and Wildlife Service, Washington, D.C.

Sassaman, Kenneth E., Mark J. Brooks, Glen T. Hanson, and David G. Anderson
1990 *Native American Prehistory of the Middle Savannah River Valley*. Savannah River Archaeological Research Papers 1. Occasional Papers of the Savannah River Archaeological Research Program, South Carolina Institute of Archaeology and Anthropology, University of South Carolina.

Seramur K. C., Cowan E.A., Lautzenheiser, L., Eastman, J.M.
In Press Occurrence and Preservation of Archaeological Sites in a Piedmont Drainage Basin, in *Proceedings of the Third International Conference on Soils, Geomorphology and Archaeology*. James Madison University.

Service, E.M.
1966 *The Hunters*. Prentice-Hall, Englewood Cliffs.

South, Stanley A.
1976 An Archaeological Survey of Southeastern North Carolina. *South Carolina Institute of Archaeology and Anthropology Notebook* 93.

1977 *Method and Theory in Historical Archaeology*. Academic Press, New York.

Stoltman, James B.
1974 *Groton Plantation: An Archaeological Study of a South Carolina Locality*. Monographs of the Peabody Museum 1, Harvard University, Cambridge.

Sutton, Mark Q. and Brooke S. Arkush
1996 *Archaeological Laboratory Methods: An Introduction*. Kendal/Hunt Publishing Company, Dubuque, Iowa.

Taylor, Richard L.,editor
1984 *Cultural Resources Survey of the Proposed Pee Dee Electric Generating Facility in Florence County, South Carolina*. Commonwealth Associates, Jackson, Michigan.

Trinkley, Michael
1980a *Additional Investigations at 38LX5*. South Carolina Department of Highways and Public Transportation, Columbia.

1980b *Investigation of the Woodland Period along the South Carolina Coast*. Ph.D. dissertation. Department of Anthropology, University of North Carolina, Chapel Hill.

1990 *An Archaeological Context for the South Carolina Woodland Period*. Chicora Foundation Research Series 22. Chicora Foundation, Inc., Columbia, S.C.

Trinkley, Michael, Debi Hacker, and Natalie Adams
1993 *Life in the Pee Dee: Prehistoric and Historic Research on the Roche Carolina Tract, Florence County, South Carolina*. Research Series 39. Chicora Foundation, Inc., Columbia.

U.S. Dept. of Agriculture
1995 Unpublished Soil Survey Maps of Bamburg County, South Carolina and Nontechnical Soil Description Report. U.S.D.A., Soil Conservation Service, Washington, D.C.

Voorhies, M.R.
1974 Pleistocene Vertebrates with Boreal Affinities in the Georgia Piedmont. *Quaternary Research* 4:85-93.

Vose, Ruth Hurst
1975 *The Antique Collector's Guides: Glass*. Crescent Books, New York.

Walthall, John A.
1980 *Prehistoric Indians of the Southeast: Archaeology of Alabama*. University of Alabama Press, University.

Walton, Peter
1976 *Creamware and Other English Pottery at Temple Newsam House, Leeds: A Catalogue of the Leeds Collection*. Manningham Press, Bradford.

Ward, Trawick
1978 *The Archaeology of Whites Creek, Marlboro County, South Carolina*. Research Laboratories of Anthropology, University of North Carolina, Chapel Hill.

1983 Whites Creek: The Second Time Around. *South Carolina Antiquities* 15:63-65.

Watson, E.J.
1916 *Twelfth Annual Report of the Commissioner of Agriculture, Commerce and Industries of the State of South Carolina*. Gonzales and Bryan, Columbia.

Watts, W.A.
1970 The Full Glacial Vegetation of Northwestern Georgia. *Ecology* 51:17-33.

1971 Postglacial and Interglacial Vegetation History of Southern Georgia and Central Florida. *Ecology* 52:666-690.

1975 Vegetation Record for the Last 20,000 Years from a Small Marsh on Lookout Mountain, Northwestern Georgia. *Geological Society of America Bulletin* 86:287-291.

1980 Late-Quaternary Vegetation History at White Pond on the Inner Coastal Plain of South Carolina. *Quaternary Research* 13:187-199.

Whitehead, Donald R.
1965 Palynology and Pleistocene phytogeography of unglaciated eastern North America. In *The Quaternary of the United States*, edited by H.E. Wright, Jr. and David G. Frey, Princeton University Press, Princeton.

1967 Studies of Full-Glacial Vegetation and Climate in Southeastern United States. In *Quaternary Paleoecology*, edited by E.J. Cushing and H.E. Wright, pp. 237-248. Yale University Press, New Haven.

1972 Developmental and Environmental History of the Dismal Swamp. *Ecological Monographs* 42:301-315.

1973 Late-Wisconsin Vegetational Changes in Unglaciated Eastern North America. *Quaternary Research* 3:621-631.

Williams, Stephen B., editor
1968 *The Waring Papers: The Collected Works of Antonio J. Waring, Jr.* Papers of the Peabody Museum of Archaeology and Ethnology 58.

Yohe, Robert M., II
1996 Analysis of Flaked Stone Artifacts. In *Archaeological Laboratory Methods: An Introduction*, edited by Mark Q. Sutton and Brooke S. Arkush, pp. 39-68. Kendall/Hunt Publishing, Dubuque, Iowa.